Petrified Forest National Park

National Park Service
U.S. Department of the Interior

Petrified Forest National Park
Arizona

Environmental Assessment / Assessment of Effect
Rehabilitate Sewage Disposal Systems

July 2004

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Petrified Forest National Park
Navajo and Apache Counties, Arizona

Summary

At Petrified Forest National Park, the National Park Service proposes to replace the aging comfort station at Agate Bridge ; install a new comfort station with flush toilets at Puerco Pueblo; restore/rehabilitate the Puerco Pueblo and Agate Bridge comfort stations into interpretative shelters; rehabilitate the comfort station at Chinde Point for year-round use, and implement a variety of other improvements to the sewage system, including replacing sections of existing sewerline and replacing and/or repairing the existing lagoon liners.

This environmental assessment examines in detail two alternatives: no action and the National Park Service preferred alternative. The preferred alternative would have no or negligible impacts to paleontological resources, archeological resources, ethnographic resources, museum collections, soundscape and lightscape management, scenic resources, soils, wilderness values, water resources, air quality, ethnographic resources, the socioeconomic environment, prime and unique farmlands, ecologically critical areas, and environmental justice.

There would be short-term, negligible, adverse impacts to visitor use and experience, and health and safety; and short-term, minor, adverse impacts to biotic communities associated with the construction. However, after project completion, there would be long-term, minor to moderate, beneficial effects to visitor use and experience; long-term, negligible to minor, beneficial effects to health and safety; and long-term negligible, adverse effects to biotic communities from the new installation of facilities.

The improvements would constitute long-term, moderate, beneficial effects to historic structures because the comfort stations would revert to informational hubs, a function which fits better with their original design. Long-term, minor to moderate, beneficial effects to park operations would also be realized because the comfort stations would be much easier to maintain as year round comfort stations and the lagoons would require less effort to remain operable.

Notes to Reviewers and Respondents

If you wish to comment on the environmental assessment, you may mail comments to the name and address below. Our practice is to make comments, including names and home addresses of respondents, available for public review during regular business hours. Individual respondents may request that we withhold their home address from the record, which we will honor to the extent allowable by law. *If you want us to withhold your name and address, you must state this prominently at the beginning of your comment.* We will make all submissions from organizations and businesses, and from individuals identifying themselves as representatives or officials of organizations or businesses, available for public inspection in their entirety.

Please address comments to:

Superintendent; Petrified Forest National Park; PO Box 2217; Petrified Forest, AZ 86028

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ACRONYMS AND ABBREVIATIONS

CFR	Code of Federal Regulations
NEPA	National Environmental Policy Act of 1969
NHPA	National Historic Preservation Act
NPS	National Park Service
NRHP	National Register of Historic Places
OSHA	Occupational Safety and Health Administration
SHPO	State Historic Preservation Office
USC	United States Code

PROPOSED ACTION

INTRODUCTION

Purpose Of and Need For Action

The National Park Service (NPS) is considering rehabilitating existing sewage disposal systems in the Petrified Forest National Park at several developed areas, and would include the repair of parts of these systems. This action is needed to address deficiencies and failed pipes and treatment components to resolve the issue of providing a safe and reliable sewage disposal system that can remain open year-round and to provide universally accessible facilities.

An environmental assessment analyzes the proposed action and alternatives and their potential impacts on the environment. This environmental assessment has been prepared in accordance with the National Environmental Policy Act of 1969, as amended (NEPA), regulations of the Council on Environmental Quality (40 *Code of Federal Regulations* (CFR) 1508.9), and National Park Service Director's Order – 12, *Conservation Planning, Environmental Impact Analysis, and Decision-making.*

PARK PURPOSE, SIGNIFICANCE, AND MISSION

An essential part of the planning process is understanding the purpose, significance, and mission of the park for which this environmental assessment is being prepared.

Park Purpose

Park purpose statements are based on national park legislation, legislative history, and National Park Service policies. The statements reaffirm the reasons for which the national park was set aside as a unit of the national park system, and provide the foundation for national park management and use.

The purpose of Petrified Forest National Park is to:

- Preserve and protect the Petrified Forest, its outstanding paleontologic sites and specimens, its associated ecosystems, cultural and historical resources, and scenic and wilderness values for present and future generations.
- Provide opportunities to experience, understand, and enjoy the Petrified Forest and surrounding area in a manner that is compatible with the preservation of park resources and wilderness character.
- Facilitate orderly, regulated, and continuing research.
- Promote understanding and stewardship of resources and park values by providing educational opportunities for students, scientific groups, and the public.

Park Significance

Park significance statements capture the essence of the national park's importance to the natural and cultural heritage of the United States of America. Significance statements do not inventory park resources; rather, they describe the park's distinctiveness and help place the park within the regional, national, and international context. Defining park significance helps managers make decisions that preserve the resources and values necessary to accomplish the purpose of Petrified Forest National Park.

Petrified Forest National Park is globally significant for its exposures of Chinle Formation fossils that preserve evidence of the late Triassic period ecosystem of more than 200 million years ago. The detailed paleontologic (fossil) and stratigraphic (layered) records of the park provide outstanding opportunities to study changes in organisms and their environments in order to better understand today's environment.

Park Mission

Park purpose describes the specific reason the park was established. Park significance is the distinctive features that make the park different from any other. Together, purpose and significance lead to a concise statement—the mission of the park. Park mission statements describe conditions that exist when the legislative intent for the park is being met.

The expansive, undulating, and colorful Painted Desert reveals layers of history that began over 200 million years ago. Life of the late Triassic period, preserved as fossils including petrified wood, offers a globally significant mosaic of an ancient ecosystem, vastly different from today. Figures pecked into boulders, the remains of ancient homes, and well-traveled pathways speak of peoples drawn here for thousands of years. Petrified Forest National Park preserves awe-inspiring vistas and rare opportunities for visitors and scientists to discover and wonder about the stories this land reveals.

PROJECT BACKGROUND, PREVIOUS PLANNING, VALUE ANALYSIS, AND SCOPING

Project Background

Park restrooms at Chinde Point, Puerco Pueblo, Agate Bridge, and Rainbow Forest have one or more deficiencies relative to accessibility, winter use, or wastewater disposal.

The picnic area at Chinde Point was constructed in the 1960s and includes a comfort station with flush toilets. Wastewater disposal is by septic tank and leach field. Water and underground power is extended to the building although the buried power line is inoperable. The comfort station is closed during the winter due to the lack of freeze protection.

Puerco Pueblo is the most frequently visited interior park location. Restrooms are housed in a stone building originally constructed in 1935 as a combination comfort and checking station. The existing comfort station cannot be made universally accessible due to structural limitations at exterior doorways. The comfort station is located immediately adjacent to the

pueblo, and the building's use is considered by American Indian groups to represent an inappropriate and offensive use of the cultural landscape.

Agate Bridge is located approximately half way between Puerco Pueblo and the south entrance. Water is piped to the site, but electrical power is several miles away. The existing stone structure was originally constructed in 1935 as a combination comfort and checking station. Currently the comfort station can only be used seasonally so that water pipes do not freeze. Wastewater flows to a septic tank and leach field that have operated without problems for many years.

The park has sewage lagoons at Rainbow Forest, Puerco Pueblo, and Painted Desert headquarters complex. The lagoons consist of three lined ponds that material is directed into for evaporation and eventual dredging. The sewage lagoons at all three locations are not operating optimally due to lack of water and material, resulting in inefficient bacterial breakdown. The Puerco Pueblo lagoons, constructed at what was the original park entrance, only service the Puerco Pueblo restrooms. Time and exposure to weather has resulted in degradation of the liners, valves, and pipes.

PREVIOUS PLANNING

In February and March of 2000, a site visit was conducted and a report prepared evaluating the condition of the comfort stations at the park and possible alternatives for rehabilitation and replacement at each site. The report summarizes two alternatives at Chinde Point, five alternatives at Puerco Pueblo, and two alternatives at Agate Bridge.

In spring 2002, an investigation contract was awarded to determine the extent of deteriorated sewerlines at Painted Desert headquarters complex and Rainbow Forest developed area. The existing sewerlines were cleaned with high-pressure water and the lines were subsequently videotaped to determine the extent and exact location of any damaged sections of pipe.

VALUE ANALYSIS

A value analysis workshop was held at the park November 27–29, 2001, to select the preferred alternative for rehabilitation of restroom facilities at three developed sites along the 28-mile park road. Several of the alternatives were derived from the 2000 evaluation, and others were creative extensions from that evaluation. A total of 11 alternatives were analyzed. The following criteria were developed to guide in the selection of the alternatives, and included:

- Remain open year-round.
- Result in universally accessible facilities.
- Not rely on conventional power for illumination.
- New facilities should mitigate impacts on historical and natural resources.
- Restrooms must be readily maintainable with regard to routine servicing, repair, and cleaning.

Although the value analysis included alternatives for a new facility at Chinde Point due to the failure of the septic system, subsequent evaluations have determined that the septic system is, in fact, operable and the only problem was a collapsed pipe. The pipe has been repaired and only rehabilitation of the Chinde Point restrooms would be necessary. This includes the addition of heat to make the restroom usable in the winter.

The preferred alternative is described under the "Preferred Alternative and Other Alternatives" section of this document and the other alternatives are discussed under the "Alternatives Considered But Eliminated from Detailed Analysis" section.

Scoping

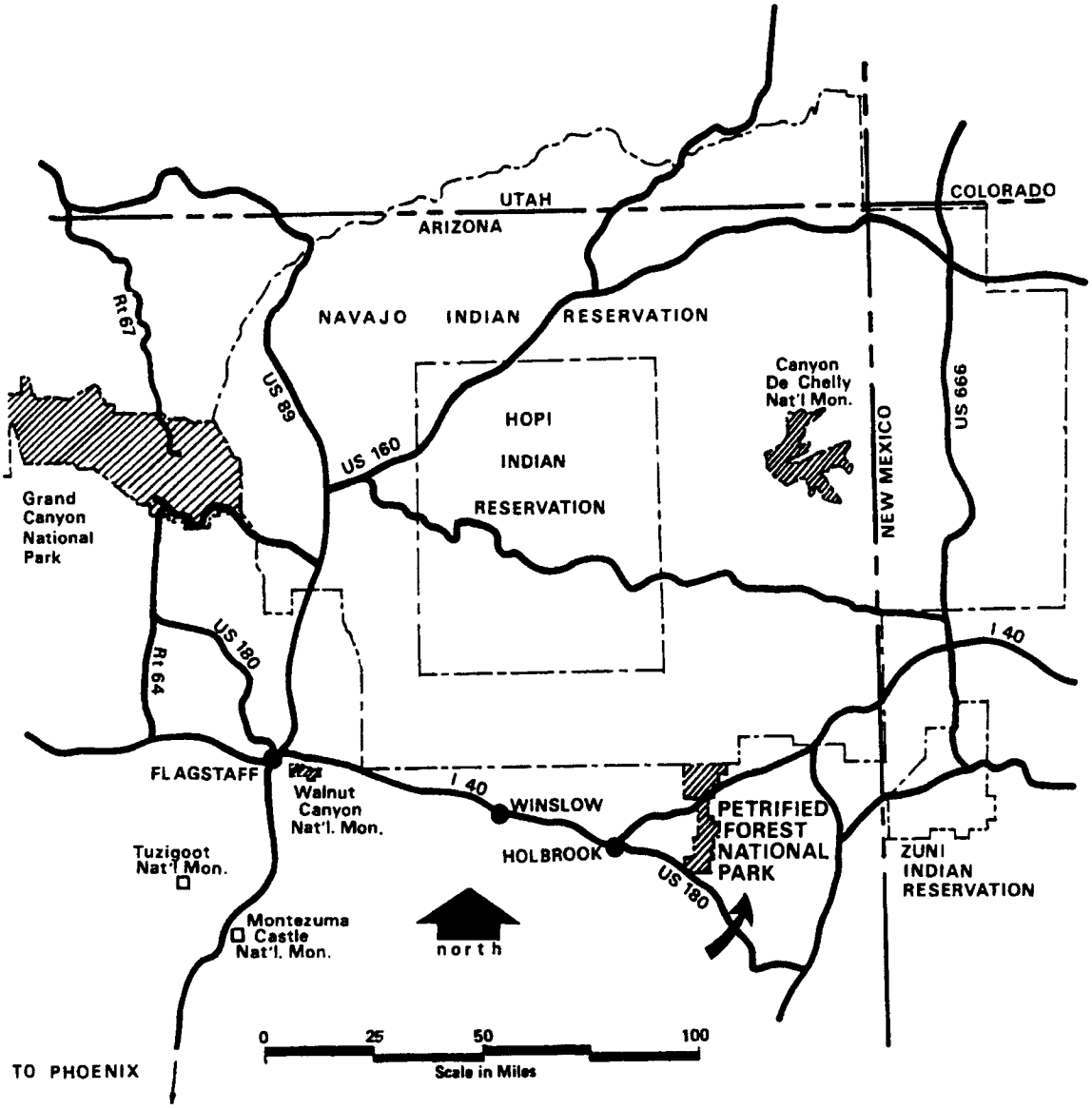
Scoping is an effort to involve agencies and the general public in determining issues to be addressed in this environmental assessment. The scoping process is used to determine important issues to be given detailed analysis in the environmental assessment and eliminate issues not requiring detailed analysis; allocates assignments among the interdisciplinary team members and/or other participating agencies; identifies related projects and associated documents; identifies permits, surveys, consultations, etc. required by other agencies; and creates a schedule that allows adequate time to prepare and distribute the environmental assessment for public review and comment before a final decision is made. Scoping includes any interested agency, or any agency with jurisdiction by law or expertise (including the state historic preservation office (SHPO) and American Indian tribes) to obtain early input.

Park staff and resource professionals of the National Park Service, Denver Service Center, conducted internal scoping. This interdisciplinary process defined the purpose and need, identified potential actions to address the need, determined the likely issues and impact topics, and identified the relationship of the proposed action to other planning efforts at the park.

A press release initiating scoping and describing the proposed action was issued in January 2003 (appendix 1). Comments were solicited during a public scoping period that ended February 24, 2003. No comments were received. The public and American Indian groups traditionally associated with the lands of the park will also have an opportunity to review and comment on the environmental assessment.

RELATIONSHIP OF THE PROPOSED ACTION TO PREVIOUS PLANNING EFFORTS

Improving the park's sewage system is consistent with the management goals and zoning of Petrified Forest National Park's *Final General Management Plan/Development Concept Plan/Environmental Impact Statement* (NPS 1992), *Statement for Management* (NPS 1996), and *Strategic Plan 2000–2005, Final General Management Revision / Environmental Impact Statement (*NPS 2004).



The Region

FIGURE 1. MAP OF THE REGION

ISSUES AND IMPACT TOPICS

Issues

Issues and concerns related to this proposal were identified from past planning efforts and from comments by environmental groups and state and federal agencies. The major issues relate to potential impacts to historic structures, biotic communities, park operations, health and safety, and visitor use and experience.

Derivation of Impact Topics

Specific impact topics were developed to focus discussion and to allow comparison of the environmental consequences of each alternative. These impact topics were identified based on federal laws, regulations, and executive orders; 2001 *NPS Management Policies*; and National Park Service knowledge of special or vulnerable resources. A brief rationale for each impact topic is given below, as is the rationale for dismissing certain topics from further consideration.

Impact Topics Selected for Detailed Analysis

Historic Structures. The National Historic Preservation Act (NHPA), as amended in 1992 (16 *United States Code* (USC) 470 *et seq.*), NEPA, National Park Service Organic Act, *NPS Management Policies* (2001), Director's Order – 12: *Conservation Planning, Environmental Impact Analysis and Decision-making* (2001), and Director's Order – 28: *Cultural Resources Management Guideline* require the consideration of impacts on cultural resources, including historic structures, either listed in or eligible to be listed in the National Register of Historic Places (NRHP). The process and documentation required for preparation of this environmental assessment will be used to comply with section 106 of the NHPA, in accordance with section 800.8(3)(c) of the Advisory Council on Historic Preservation's regulations (36 CFR Part 800). This document will be submitted to the Arizona SHPO for review and comment.

The preferred alternative would not affect the Crystal Forest Cultural Landscape, Rainbow Forest Historic Landscape, the proposed Painted Desert Community Complex Cultural Landscape, or the potential Puerco River Cultural Landscape (archeological) because no undertakings are proposed in the vicinity of the resources.

The Painted Desert headquarters complex has recently been recognized as an important example of Mission 66 Program architecture (NPS 1997a). The Arizona SHPO considers the visitor center / headquarters complex to be significant, and it is potentially eligible for the NRHP. The Painted Desert headquarters complex could be a cultural landscape. Implementation of the proposed action would not alter the topography, vegetation, circulation features, spatial organization, or land-use patterns of the potential landscape, and any adverse impacts associated with the sewer system improvements would be short term and negligible. In addition, any visual, audible, and atmospheric intrusions associated with construction would be temporary and negligible, lasting only as long as construction. Because the integrity of this

potential landscape would be unaffected, cultural landscapes were dismissed. Therefore, the complex is not addressed further in this environmental assessment.

The park manages the comfort stations at Puerco Pueblo and Agate Bridge as historic structures. Therefore, they are addressed as historic structures in the environmental assessment. Though not obligated to do so under NHPA, the National Park Service would treat the proposed action as a36CFR800 section 106-eligible project. Any and all project plans for these buildings will be submitted to the Arizona SHPO for review and comment. They are not officially subject to NHPA section 106 compliance because the Arizona SHPO does not consider them historic under the mandate of the NHPA.

Biotic Communities (wildlife, vegetation, and threatened and endangered species). NEPA is the basic national charter for protection of the environment. It requires federal agencies to use all practicable means to restore and enhance the quality of the human environment and to avoid or minimize any possible adverse effects of their actions upon the environment. National Park Service policy is to protect the natural abundance and diversity of naturally occurring biotic communities within national park units. Because the sewerline alternatives in this document have the potential to affect biotic communities, this impact topic will be addressed.

Park Operations. Park operations could be affected by both the no-action and action alternatives. Therefore, park operations are addressed as an impact topic.

Health and Safety. Public health and safety could potentially be affected by the no-action and action alternatives, so this topic is addressed in the environmental assessment.

Visitor Use and Experience. Visitor use and experience could be affected by both the no-action and action alternatives, therefore, it is addressed as an impact topic.

Impact Topics Dismissed from Detailed Analysis

Archeological Resources. Prehistoric resources are extensive in Petrified Forest National Park and include over 600 recorded sites representing Paleo-Indian, Archaic, Basketmaker, Puebloan, and Navajo cultures. Pit houses, campsites, multi-room pueblos, projectile points, ceramics, and other resources comprise the park archeological record. Pictographs are rare, but large concentrations of petroglyphs are etched into the desert varnish that forms on the sandstone that abounds in the park. There is evidence that the park has numerous unrecorded sites within its boundaries. Twelve of the more than 600 recorded sites have been excavated. The others form a regionally significant “data bank” of future scientific information (NPS 1996). Historic archeological resources are also located throughout the park. The sites represent the expanse of the park’s history, from the 19th century to the 1950s. The Puerco Pueblo comfort station is near two known archeological sites. For the purpose of this environmental assessment, all sites are treated as potentially eligible for listing on the NRHP.

Sue Wells, archeologist with the Western Archeological and Conservation Center (WACC), prepared an assessment of effect for the Rainbow Forest sewerline replacement on March 30, 2004. Her research revealed nine sites (seven historic and two prehistoric) within or near the project area. Only one of the sites (AZ: Q: 1: 28) would be potentially affected by the project.

This site is a fairly large (approximately 80 acres) surface scatter associated with a prehistoric chipped stone quarry located in the vicinity of the Rainbow Forest residential area. The site has been previously disturbed by the construction of the residences. Replacement of the sewerline would not be expected to adversely affect the site because work would be confined within trenches made in 1963 during the initial sewer line installation and re-excavating the trenches would not cause additional disturbance (Wells 2004).

The majority of the work proposed is above ground and in extensively disturbed areas, including Puerco Pueblo. Before initiating any activities that may affect archeological resources, clearance similar to that described above for the Rainbow Forest sewerline would be obtained.

Any unknown sites encountered during the project would be subjected to mitigation described below in "Mitigation Measures for the Preferred Alternative." Since there are no known archeological resources that are expected to be impacted by the project, this topic is dismissed from further analysis.

Indian Trust Resources. Secretarial Order 3175 requires that any anticipated impacts to Indian trust resources from a proposed project or action by Department of Interior agencies be explicitly addressed in environmental documents. The federal Indian trust responsibility is a legally enforceable fiduciary obligation on the part of the United Sates to protect tribal lands, assets, resources, and treaty rights, and it represents a duty to carry out the mandates of federal law with respect to American Indian and Alaska Native tribes.

There are no Indian trust resources in Petrified Forest National Park. The lands comprising the park are not held in trust by the Secretary of the Interior for the benefit of Indians due to their status as Indians. Therefore, Indian trust resources was dismissed as an impact topic.

Ethnographic Resources. The park is adjacent to the Navajo Reservation, and Navajo new lands, and the White Mountain Apache, Hopi, and Zuni Reservations are all within 80 miles of the park. The cultures of these people are inextricably bound with the lands once occupied by their ancestors. They view much of the park landscape as spiritually active, containing sites vital to the continuation of their lifeways. Although more than one American Indian ethnic group shares some ethnographically significant resources, most are unique to specific tribes. The park considers ethnographic sites significant and is committed to their preservation, protection, and confidentiality.

There are no known ethnographic resources in the proposed project area. Copies of the environmental assessment will be forwarded, however, to tribes for review and comment. If the tribes identify ethnographic resources in the project area, appropriate mitigation measures will be undertaken in consultation with the tribes. The location of ethnographic resources will not be made public. Since there are no known ethnographic resources within the project area at this time, this topic will not be addressed further in the environmental assessment unless new information becomes available.

Museum Collections. The undertakings described in this environmental assessment are subject to Director's Order – 24: *NPS Museum Collections Management* (2000). Museum

collections will not be affected by any of the activities analyzed in this environmental assessment. Therefore, museum collections will not be addressed further.

Soundscape and Lightscape Management. In accordance with the *NPS Management Policies* (2001) and Director's Order – 47: *Sound Preservation and Noise Management*, an important part of the National Park Service mission is preservation of natural soundscapes associated with national park units. Natural soundscapes exist in the absence of human-caused sound. The natural ambient soundscape is the aggregate of all the natural sounds that occur in park units, together with the physical capacity for transmitting natural sounds. Natural sounds occur within and beyond the range of sounds that humans can perceive and can be transmitted through air, water, or solid materials. The frequencies, magnitudes, and durations of human-caused sound considered acceptable varies among National Park Service units, as well as potentially throughout each park unit, being generally greater in developed areas and less in undeveloped areas.

In accordance with *NPS Management Policies* (2001), the National Park Service strives to preserve natural ambient landscapes, which are natural resources and values that exist in the absence of human-caused light.

Noise associated with construction activities would be short term and localized, and activities would be scheduled to minimize effects on visitor experience. Overall effects would be negligible. Lightscapes would not be affected by the proposed sewage disposal system improvements. These topics were, therefore, dismissed from detailed analysis.

Scenic Resources. In the evaluation of scenic quality, both the visual character and visual quality of a viewshed should be considered. A viewshed comprises the limits of the visual environment associated with the park. Aesthetics is an important component that contributes to visual or scenic quality and the sense of solitude prized by many park visitors. Visibility at Petrified Forest National Park is excellent, with distant topography visible. The National Park Service has identified several scenic views that are part of the visitor experience and worthy of protecting. The only aspect of the project that has the potential to affect scenic quality is the construction of the new restroom facilities . The Agate Bridge location was of particular concern because of the possibility that the new toilets would affect the view from Blue Mesa. However, the toilets would be constructed to resemble sandstone block structures, located in parking areas where other structures already exist, and be placed out of prominent lines of sight as much as possible. Therefore, effects to scenic resources would be negligible and this topic was dismissed from detailed analysis.

Soils. Pipe work proposed for the Painted Desert headquarters complex and Rainbow Forest area would be within the original sewerline corridor. The proposed new sewerline for the relocated Puerco Pueblo facilities would traverse the existing parking lot from the existing manhole on the main road, affecting only highly disturbed areas. The repair of the sewage lagoons is not expected to affect any soils that are not already highly disturbed.

Any soil disturbance would be short term, generally limited to narrow corridors and small areas, and would be confined to previously disturbed areas. Overall, impacts of this project on soils would be negligible. Therefore, soils were dismissed from detailed analysis.

Geologic Hazards. There are no specific geologic hazards such as earthquakes, volcanoes, or landslides in the project area. Therefore, geologic hazards were dismissed from detailed analysis.

Petrified Wood and Other Fossils. Paleontological resources at Petrified Forest National Park, including petrified wood and fossilized paleoflora and paleofauna, are derived from sedimentary deposits of the late Triassic period. Over 200 fossilized plant species and 60 fossilized animal species have been described from the Chinle formation at the park (NPS 1998, 2001b).

A comprehensive survey of petrified wood and other fossil resources of the park is not yet complete. However, many special fossil and petrified wood areas within the park have been identified and mapped by park resource managers and other experts. Petrified wood is scattered throughout the park, but the heaviest concentrations are located south of Interstate 40. Giant Logs and Long Logs, located near Rainbow Forest, have trails that provide visitors with the opportunity to walk through major concentrations of petrified wood, including massive logs. Generally, the sewerline alignment misses significant concentrations of petrified wood.

A survey conducted by the park paleontologist (appendix 4) determined that proposed project sites occur in horizons that are not historically fossiliferous and paleontological resources would not likely be impacted during the course of the sewer project (Parker 2003). Therefore, petrified wood and other fossils was dismissed as an impact topic.

Wilderness Values. The two wilderness units within the park were designated by Congress and are legally protected as wilderness in perpetuity. The *2001 NPS Management Policies* (NPS 2001a) requires the administration of NPS-managed wilderness in such a manner as will leave them unimpaired for future use and enjoyment as wilderness. All proposed improvements are located well away from and out of sight of park wilderness areas. They would not affect wilderness values, so this topic was dismissed from detailed analysis.

Water Resources, Including Wetlands, Floodplains, and Water Quality. Executive Orders 11988 (*Floodplain Management*) and 11990 (*Protection of Wetlands*) require an examination of impacts to floodplains and wetlands, and examination of potential risk involved in placing facilities within floodplains, and protecting wetlands. The 2001 *NPS Management Policies* (NPS 2001a), Director's Order – 2: *Planning Guidelines*, and Director's Order – 12: *Conservation Planning, Environmental Impact Analysis, and Decision-making* provide guidelines for proposals in wetlands and floodplains.

There are no jurisdictional or NPS-defined wetlands within the project area.

The 1972 Federal Water Pollution Control Act, as amended by the Clean Water Act of 1977, is a national policy to restore and maintain the chemical, physical, and biological integrity of the nation's waters; to enhance the quality of water resources; and to prevent, control, and abate water pollution. The 2001 *NPS Management Policies* (NPS 2001a) provides direction for the preservation, use, and quality of water in national parks. Impacts to water quality from implementation of the preferred alternative would generally be avoided, but some temporary, localized sedimentation could occur if rain or snow falls during excavation of trenches. Such

impacts would be mitigated by scheduling work in the vicinity of washes during the dry season, and by using silt fences and other best management practices, as appropriate. Impacts to water quality would be negligible as a result.

Executive Order 11988 (*Floodplain Management*) requires an examination of impacts to floodplains and examination of potential risk involved in placing facilities within floodplains. The 2001 *NPS Management Policies* (NPS 2001A), Director's Order – 2: *Planning Guidelines*, and Director's Order – 12: *Conservation Planning, Environmental Impact Analysis, and Decision-making* provide guidelines for projects in floodplains.

The wastewater disposal system at Rainbow Forest would be repaired in the preferred alternative. A small portion of this disposal system pipeline (a segment of the pipeline from the Rainbow Forest concessions buildings) is located within the 500-year floodplain. A short segment of the pipeline runs near Jim Camp Wash and is within the 100-year floodplain. In any case, any impacts to floodplains resulting from excavating and refilling a new pipeline trench would be temporary—occurring only if a major flood event occurs during construction—and negligible. The chance of flooding during one year within the 500-year floodplain is 0.2% and the chance of flooding during one year within the 100-year floodplain is 1% (National Park Service Special Directive 93-4, *Floodplain Management*).

Because (1) there would be no impacts to wetlands, (2) impacts to floodplains would be negligible, and (3) impacts to water quality would be negligible, water resources was dismissed as a detailed impact analysis topic.

Air Quality. The 1963 Clean Air Act, as amended (42 USC 7401 *et seq.*), requires land managers to protect air quality. Section 118 of the Clean Air Act requires parks to meet all federal, state, and local air pollution standards. *NPS Management Policies* (2001) addresses the need to analyze potential impacts to air quality during park planning. Petrified Forest National Park is classified as a Class I air quality area under the Clean Air Act, as amended. The Clean Air Act also states that the federal land manager has an affirmative responsibility to protect the park's air quality-related values (including visibility, plants, animals, soils, water quality, cultural and historic resources and objects, and visitor health) from adverse air pollution impacts.

Implementation of the proposed action would temporarily affect local air quality through increased dust and vehicle emissions. Hydrocarbon, nitrous oxide, and sulfur dioxide emissions would be rapidly dispersed by the prevalent winds in the project area. Dust stirred up by construction equipment would increase airborne particulates intermittently, but this phenomenon is not expected to be appreciable. Mitigating measures such as water sprinkling to reduce dust and limiting idling of construction equipment would be used, as appropriate, to mitigate effects.

Overall, impacts to air quality from dust and construction equipment emissions would be negligible and temporary. Effects would occur only during construction; no long-term, adverse effects would be expected. Therefore, air quality was dismissed from detailed analysis.

Socioeconomic Environment. The proposed action would not change local or regional land use or transportation, nor would it appreciably affect concessions operation, local businesses

or agencies. Implementation of the preferred alternative could provide a negligible beneficial impact to the economies of Holbrook, Arizona, and Navajo and Apache Counties (e.g., minimal increases in employment opportunities for the construction work force and revenues for local businesses and government from construction activities and workers). Any benefit to the economy would be temporary (lasting only during construction) and negligible overall. Therefore, the socioeconomic environment was dismissed as an impact topic.

Prime and Unique Farmlands. In August 1980, the Council on Environmental Quality directed that federal agencies assess the effects of their actions on farmland soils classified by the United States Department of Agriculture's Natural Resources Conservation Service as prime or unique. Prime or unique farmland is defined as soil which particularly produces general crops such as common foods, forage, fiber, and oil seed; unique farmland produces specialty crops such as fruits, vegetables, and nuts. The proposed project is exempt from the requirements of the Farmland Protection Policy Act because there are no prime farmlands associated with the project area, and there are no potential impacts that would directly affect wetland areas associated with agriculture. Therefore, prime and unique farmlands were dismissed from detailed analysis.

Ecologically Critical Areas, Wild and Scenic Rivers, Other Unique Natural Areas. No areas within the park have been designated as ecologically critical, and there are no existing or potential wild and scenic rivers within the park. The national park is an important natural area, and the alternatives would not threaten the qualities and resources that make the park special. This topic was, therefore, dismissed from detailed analysis.

Environmental Justice. Executive Order 12898 (*General Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*) requires all agencies to incorporate environmental justice into their missions by identifying and addressing disproportionately high and adverse human health or environmental effects of their programs and policies on minorities and low-income populations or communities. No alternative would have disproportionate health or environmental effects on minorities or low-income populations or communities as defined in the Environmental Protection Agency's Draft Environmental Justice Guidance (July 1996). Environmental justice was dismissed from detailed analysis.

PREFERRED ALTERNATIVE AND OTHER ALTERNATIVES

INTRODUCTION

This section describes two management alternatives for the rehabilitation of existing sewage disposal systems. Alternatives for this project were developed to resolve the issue of providing a safe and reliable sewage disposal system that can remain open year-round and is universally accessible.

NO-ACTION ALTERNATIVE

This alternative refers to a continuation of existing conditions without implementation of the preferred alternative. Implementation of the no-action alternative means that improvements to sewage disposal systems would not occur. With this alternative, the park would continue using and maintaining the existing comfort stations and disposal systems.

Currently, the restrooms are cleaned once a day and checked once a day. The structures do not have impervious surfaces and are difficult to clean, creating a health risk. The comfort stations are dark and gloomy. The restrooms would remain closed during the winter months.

The sewage lagoon at Rainbow Forest and Painted Desert headquarters complex are not operating optimally due to lack of water and material, resulting in inefficient bacterial breakdown. Additional deficiencies include deteriorated lagoon liners and pipes.

The no-action alternative is prescribed by Council on Environmental Quality regulations and serves as a benchmark for comparing the management direction and environmental consequences of the preferred alternative. Should the no-action alternative be selected, the park would respond to future needs and conditions associated with the sewage disposal without major actions or changes from the present course.

PREFERRED ALTERNATIVE

The preferred alternative presents the National Park Service proposed action and defines the rationale for the action in terms of resource protection and management, visitor and operational use, and costs. The preferred alternative meets the park's planning objectives of providing a safe and reliable sewage disposal system that can remain open year-round and is universally accessible. The locations for each of the areas of planned activities are shown on figure 2.

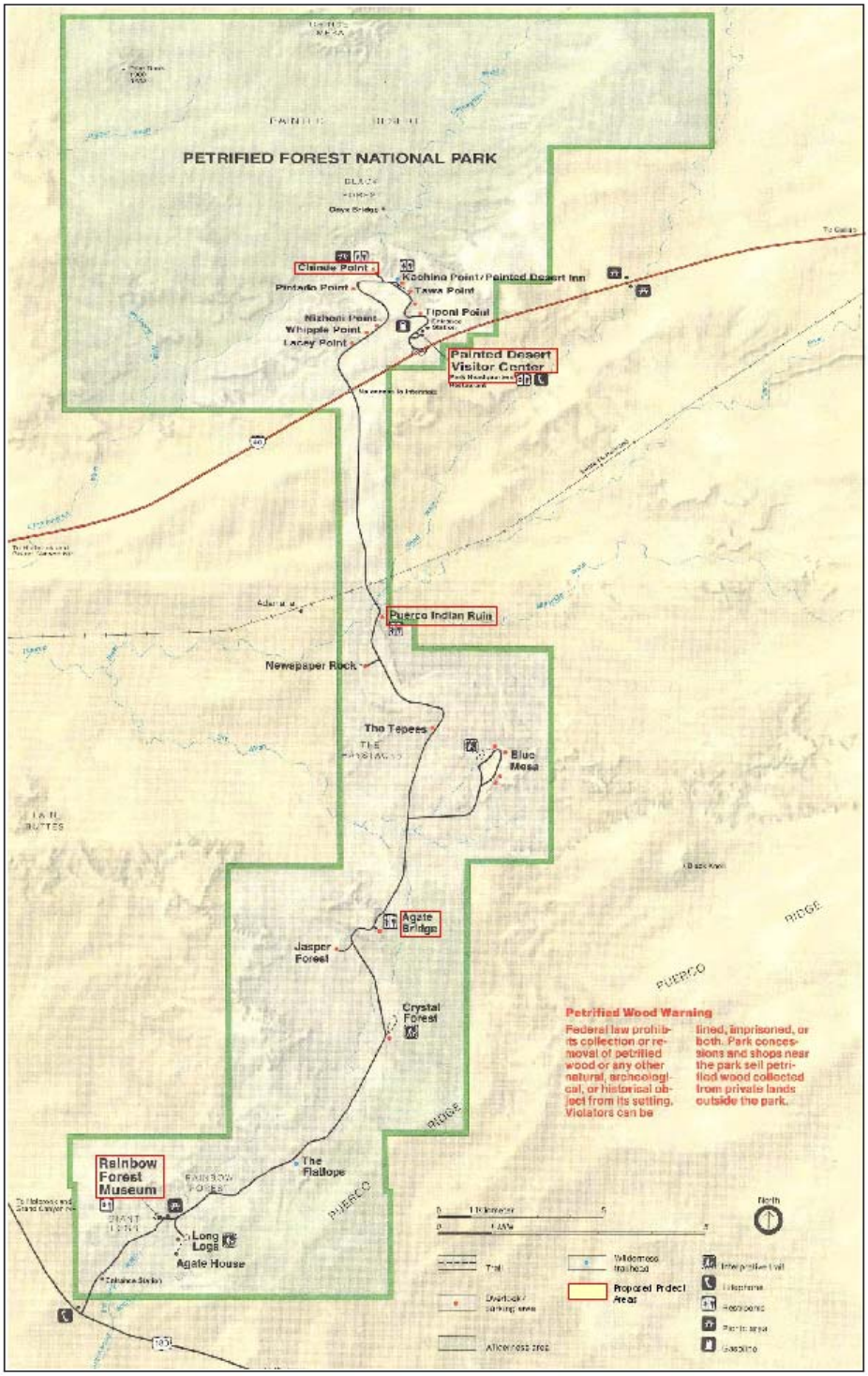


Figure 2: Areas of Planned Activities

Chinde Point

Under this alternative, the interior of the Chinde Point picnic area comfort station (figure 3) would be rehabilitated and a heating system would be installed (to allow for winter use). An existing power system would be evaluated and upgraded or replaced, as necessary. Replacement, if necessary, would occur along the same corridor as the existing power system.

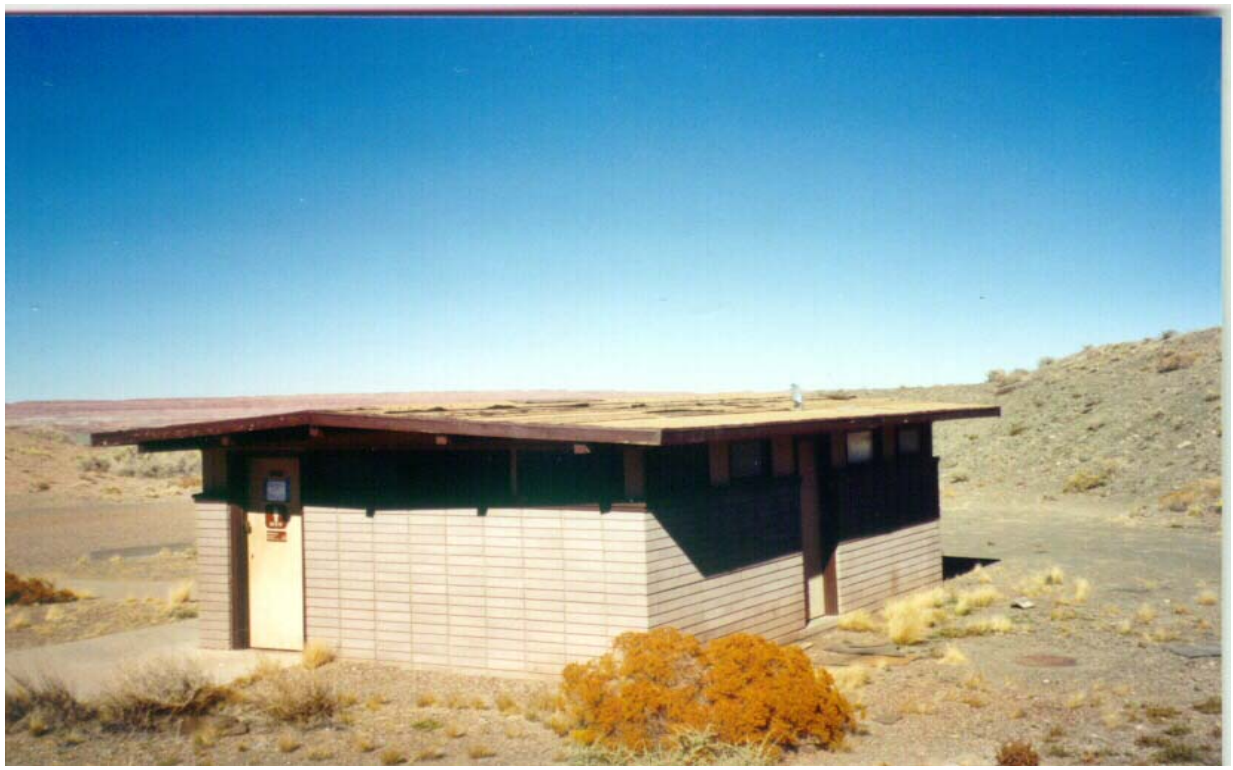


FIGURE 3. CHINDE POINT COMFORT STATION

Puerco Pueblo

Under this alternative, the existing comfort station at Puerco Pueblo would be restored / rehabilitated into an interpretative shelter by removing all infill construction and plumbing fixtures and opening the original fenestration on the east and west walls (figure 4). A new 400-square foot comfort station would be built adjacent to the parking lot. The sandstone block structure constructed of vernacular building materials would be universally accessible. It would have two toilets and sinks for women and one urinal, one toilet, and two sinks for men. A storage closet with shelving and a mop sink would be included. Power, water, and sewage would be provided through existing underground utility systems. New sewer and waterlines would be run a short distance from the existing manhole on the main road, through the parking lot, to the new comfort station location.

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FIGURE 4. PUERCO PUEBLO COMFORT STATION

The Puerco Pueblo lagoons (figure 5) that serve the Puerco Pueblo comfort station, would be rehabilitated. Liners would be replaced and a commutator and aeration system would be installed.

FIGURE 5. PUERCO SEWAGE LAGOONS

Agate Bridge

Under this alternative, the existing comfort station at Agate Bridge (figure 6) would be restored / rehabilitated into an interpretative shelter by removing all infill construction and plumbing fixtures and opening the original fenestration on the east and west walls. A new comfort facility would be constructed adjacent to the parking lot in a location yet to be determined. The unit would be finished in architecture of stucco with stone wainscot, metal doors, windows, decorative vigas, and skylights. New sidewalks would be installed, as necessary. Existing underground utilities would be tied into the new structure. An alternative power source would be evaluated and implemented, including the use of solar panels or a wind generator. Once a final decision is made on the exact location and alternative power source, additional review under the NEPA may be necessary.

FIGURE 6. AGATE BRIDGE COMFORT STATION

Painted Desert Headquarters Complex

At Painted Desert headquarters complex, the preferred alternative would include replacing several sections of existing sewerline. The pipe would be replaced in the same location and grade problems would be addressed. At the lagoons (figure 7), the existing liners would be replaced or repaired, a new septage receiving station would be installed, a commutator and aeration system would be added to the leachfield, and a waterline from the housing area would be extended to bring in water for wash down at the septage receiving station.

Rainbow Forest

At Rainbow Forest, the preferred alternative would include replacing several sections of existing sewerline (figure 8). The main sewerline from behind the concessions building to the lagoons would be replaced, a distance of approximately 1,300 feet. A benched section along the intermittent streambed (Jim Camp Wash) is eroding and would be stabilized. At the lagoons (figure 9), the existing liners would be repaired, a new splitter box installed, a

commutator and aeration system would be added to the leachfield, and other general clean-up activities would be conducted.

FIGURE 7. PAINTED DESERT HEADQUARTERS COMPLEX SEWAGE LAGOONS

FIGURE 8. RAINBOW FOREST SEWAGE LINE ALIGNMENT

FIGURE 9. RAINBOW FOREST SEWAGE LAGOONS

Mitigation Measures for the Preferred Alternative

Construction zones would be identified and fenced with construction tape or some similar material prior to any construction activity. The fencing would define the construction zone and confine activity to the minimum areas required for the project. All protection measures would be clearly stated in the construction specifications and workers would be instructed to avoid areas beyond the construction zone. Materials may be stockpiled at the park bone yard or in the Rainbow Forest parking lot.

To avoid the introduction of non-native plant species, hay bales would not be used to control soil erosion. Hay often contains seeds of undesirable or harmful alien plant species. Therefore, straw wattles would be used to control soil erosion. The following straw materials may be used: rice straw, straws determined by the National Park Service to be weed free (e.g., Coors barley straw or Arizona winter wheat straw), and cereal grain straw that has been fumigated to kill weed seed.

Any potential excavations in the vicinity of natural washes would be undertaken during the dry season. Silt fences or wattles and other best management practices would also be used, as appropriate, to minimize erosion and sedimentation. Water sprinkling to reduce dust and limiting idling of construction equipment would be used, as appropriate, to mitigate potential air quality effects during construction.

Trenching operations would utilize a rock saw, backhoe, and/or trencher. As the trench is dug, the excavated material would be side-cast for storage. When trenching is complete, bedding would be placed and compacted in the bottom of the trench, and the pipeline would be installed in the bedding. Open trenches would be day lighted at the end of the work day. Backfilling and compaction would begin immediately after the lines are placed into the trench, and the trench surface would be returned to pre-construction contours. All trenching operations would follow guidelines to minimize vegetation disturbance and restore affected areas to their original form wherever possible, as approved by park staff. All trenching would be monitored by a qualified archeological technician.

Topsoil from excavations would be removed and stockpiled. Local topsoil would help preserve microorganisms and seeds of native plants in the soil. The topsoil would be re-spread as close to its original location as possible.

Construction activities would be conducted in previously disturbed areas (e.g., the parking lot perimeters or the Rainbow Forest developed area) to the extent possible. Staging areas for construction vehicle and equipment storage and for turnarounds, would be located in previously disturbed areas and would be clearly identified in advance. Construction workers and supervisors would be informed about the special sensitivity of Petrified Forest National Park resources (such as petrified wood and archeological resources) and the laws and guidelines to ensure their protection.

If previously unknown paleontological or archeological resources are discovered during construction activities, all work in the immediate area of the discovery would cease until the resources could be identified and documented. If paleontological sites are discovered and

cannot be avoided, the resource would be recorded and recovered, if possible. Work can only resume after the appropriate mitigation is completed. If archeological sites are discovered and cannot be avoided, the information they possess regarding prehistoric and/or historic lifeways would be recorded and recovered in consultation with the Arizona SHPO and interested federally recognized American Indian tribes. Work could resume only after an appropriate mitigation strategy is developed in consultation with the Arizona SHPO, and after archeological clearances are obtained. These stipulations would be codified in an inadvertent discovery plan to be developed by Petrified Forest National Park for the project.

In compliance with the Native American Graves Protection and Repatriation Act of 1990, the National Park Service would also notify and consult with concerned tribal representatives for the proper treatment of human remains, funerary, and sacred objects should these be discovered during the course of the project.

Sustainability. The National Park Service has adopted the concept of sustainable design as a guiding principle of facility planning and development. The objectives of sustainability are to design National Park Service facilities to:

- minimize adverse effects on natural and cultural values
- reflect their environmental setting
- maintain and encourage biodiversity
- construct and retrofit facilities using energy-efficient materials and building techniques
- operate and maintain facilities to promote their sustainability
- illustrate and promote conservation principles and practices through the sustainable design and ecologically sensitive use

Essentially, sustainability is living within the environment. The proposed action subscribes to and supports the practice of sustainable planning, design, and use of the sewage disposal system and associated public and administrative facilities serviced by it.

ALTERNATIVES CONSIDERED BUT DISMISSED FROM DETAILED ANALYSIS

During the value analysis workshop conducted in July/August of 2001, additional alternatives were examined and discussed in detail. Through the value analysis process, and other park planning efforts, the following alternatives were eliminated from further analysis.

Chinde Point

Three other alternatives were considered for Chinde Point. The first alternative was to rehabilitate the existing comfort station and install a new septic tank and leach field. This alternative was dismissed because it was discovered that the current septic system is functional. Another alternative stipulated that the Chinde Point comfort station be demolished and a unisex, manufactured, two-stall vault toilet facility be installed. Again, once it was discovered that the septic system is functional, this alternative was deemed unnecessary.

A third alternative for Chinde Point included converting the existing comfort station into vault toilets. This alternative was dismissed because digging under the slab would be required, which adds significant costs to the conversion and is hazardous to workers.

Puerco Pueblo

Vault toilets were considered for Puerco Pueblo, but the existing infrastructure supported flush toilets with relatively minor repairs and improvements to the system, and vault toilets were considered to require more maintenance. Vault toilets were eliminated.

An alternative for Puerco Pueblo was to remove the toilets altogether. This would leave a distance of 20 miles between restroom facilities. This alternative would diminish the visitor experience and was dismissed.

Agate Bridge

An alternative considered for Agate Bridge was to remove the toilets altogether and restore / rehabilitate the comfort station into an interpretative shelter. This would leave a distance of 18 miles between restroom facilities. This alternative would diminish the visitor experience and was dismissed.

ENVIRONMENTALLY PREFERRED ALTERNATIVE

According to the Council on Environmental Quality regulations implementing NEPA, and the National Park Service NEPA Guidelines (Director's – Order 12), an environmentally preferred alternative must be identified in an environmental assessment. In order for an alternative to be environmentally preferred, it must meet the criteria established in section 101(b) of NEPA and subsequently adopted by the National Park Service. An alternative must meet the following criteria to be considered an environmentally preferred alternative:

1. Fulfill the responsibilities of each generation as trustee of the environment for succeeding generations.
2. Ensure for all Americans safe, healthful, productive, and esthetically and culturally pleasing surroundings.
3. Attain the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences.
4. Preserve important historic, cultural, and natural aspects of our national heritage and maintain, wherever possible, an environment that supports diversity and variety of individual choice.
5. Achieve a balance between population and resource use that will permit high standards of living and a wide sharing of life's amenities.
6. Enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.

The no-action alternative does not meet the above criteria. The environmentally preferred alternative in this environmental assessment is the proposed action. This alternative and several others previously described were analyzed during the value analysis study. This alternative was selected as the best value when considering construction costs, life-cycle costs, and other advantages including:

- preventing loss of natural resources
- preventing loss of cultural resources
- protecting public health, safety, and welfare
- improving operations efficiency and sustainability
- protecting employee safety and welfare

In short, this alternative would minimize disturbance to known resources; remove human-made features from the environment; preserve the historic structures; provide good protection of public and employee health, safety, and welfare; and improve day-to-day operations. Total project costs are estimated to be between $300,000 and $500,000, but could change based on ongoing evaluations of existing power sources.

COMPARATIVE SUMMARY OF NO-ACTION AND PREFERRED ALTERNATIVES

TABLE 1. COMPARATIVE SUMMARY OF ALTERNATIVES

Alternative A: No Action	Alternative B: Preferred Alternative
In the no-action alternative, the restrooms would remain difficult to clean and maintain. The disposal system would continue to back up and overflow occasionally and have to be closed. The restrooms would remain closed during the winter months and not be universally accessible. The sewage lagoons at Rainbow Forest and Painted Desert headquarters complex would continue to suffer from the lack of water and material, resulting in inefficient bacterial breakdown. The lagoons must be dredged more often. The deteriorated lagoon liners and pipes would remain. The no-action alternative does not meet the purpose and need.	Under this alternative, the Chinde Point comfort station would be rehabilitated and power and heat installed to allow for year-round use. The existing comfort stations at Puerco Pueblo and Agate Bridge would be restored / rehabilitated into interpretative shelters. At Puerco Pueblo, new flush toilets would be constructed near the parking lot and the lagoons would be rehabilitated. At Agate Bridge, new facilities would be constructed and tied into the existing underground utilities. Alternative power sources would be used for power and heat. At Painted Desert headquarters complex and Rainbow Forest, the preferred alternative would include a variety of improvements including replacing sections of existing sewerline and replacing and/or repairing the existing liners. The preferred alternative meets the project objectives of providing a reliable, safe sewage disposal system for the park, enhancing visitor experience, and increasing operational efficiency and health and safety.

COMPARATIVE SUMMARY OF POTENTIAL ENVIRONMENTAL IMPACTS

TABLE 2. COMPARATIVE SUMMARY OF POTENTIAL ENVIRONMENTAL IMPACTS

Potential Environmental Impacts		
Impact Topic	**Alternative A: No Action**	**Alternative B: Preferred Alternative**
Historic Structures	No new impacts resulting from the no-action alternative.	Direct, long-term, moderate benefit to historic structures.
Biotic Resources	No new impacts resulting from the no-action alternative.	Localized, short-term, minor, adverse impacts on biotic communities at the park during the project. Long-term, minor, localized, and long-term, negligible, adverse impacts with the construction of the new Puerco Pueblo comfort station.
Visitor Use and Experience	No change in direct or indirect impacts on visitor experience from the no-action alternative. However, this alternative would have long-term, minor, adverse impacts on visitor experience.	Short-term, negligible, adverse impacts to visitor use and experience during construction. However, once construction is complete, there would be a long-term, minor to moderate, beneficial effect on visitor use and experience.
Park Operations	No change in direct or indirect impacts on park operations under this alternative. However, the existing condition of the comfort stations constitutes a long-term, minor to moderate, adverse impact to park operations.	Long-term, minor to moderate, beneficial effect on park operations.
Health and Safety	No change in direct or indirect impacts on health and safety under this alternative. However, negligible to minor, adverse impacts on human health and safety from contamination risk and construction hazards would continue.	Short-term, negligible, and adverse impact to construction workers during construction. However, once the project is completed, the effects to human safety and health would be long-term, negligible to minor, and beneficial.

AFFECTED ENVIRONMENT

Detailed information on resources of Petrified Forest National Park can be found in the *General Management Plan* (NPS 1993), *General Management Plan Revision* (NPS 2004) and the park *Resources Management Plan* (NPS 1998). A description of the park and resources potentially affected by the waterline project follows.

LOCATION AND GENERAL DESCRIPTION OF THE PARK

Petrified Forest National Park is located in northeastern Arizona, about 100 miles east of Flagstaff, Arizona, and about 70 miles west of Gallup, New Mexico. The park lies within Navajo and Apache Counties. It is bordered by the Navajo reservation to the north and northwest; and by Hopi-owned land, private lands, state trust lands, and U.S. Bureau of Land Management lands to the south, east, and west. Several other American Indian reservations and national forests are nearby. Interstate Highway 40 and the Burlington Northern-Santa Fe Railroad transect the park from east to west.

Petrified Forest National Park contains one of the largest and most colorful concentrations of petrified wood in the world. Exposures of the 225-million-year-old Chinle formation extend throughout the Painted Desert. Fossils preserved in this formation represent an entire ecosystem. These rare, accessible associations of animal and plant fossils make the park one of the best places in the world for the study of the late Triassic period.

The park also contains historic structures, archeological sites, petroglyphs, wildlife, and interpretive exhibits. Of the park's 93,533 acres, about 54% is designated wilderness arranged in two units: the Painted Desert unit in the north segment of the park (43,020 acres), and the Rainbow Forest unit in the southeast segment of the park (7,240 acres). Air quality in the park is usually good, providing opportunities to view scenic vistas, including mountain peaks more than 100 miles away.

The vegetation of Petrified Forest National Park is varied. Soil and terrain conditions have resulted in a mosaic of grass and shrub communities. Sparse stands of juniper are found on rocky upper slopes and mesa caps. A limited stand of pinion-juniper woodland is found on Chinde Mesa, along the park's far northern boundary. Grasslands occupy middle and upper plateau areas where soils are deeper and richer. Since grazing was eliminated from the park in the 1960s, the shortgrass prairie has recovered in many areas. Desert plant communities are found in the lower elevations where soils are heavy and water availability low. The most diverse area for plants is Puerco River corridor—40 species (30 native to North America) can be found here. Willows, native cottonwoods, and the dominant non-native shrub, tamarisk, are typical of the Puerco River riparian zone. Shrubs typical of the Great Basin and cool desert, such as big sagebrush, shadscale, greasewood, and winterfat, also occur in the park.

Park elevation averages 5,600-feet above sea level, resulting in a cool, arid climate. Annual precipitation averages less than 10 inches, about half of which is from late summer thunderstorms. Midsummer temperatures can exceed 100 degrees Fahrenheit (38 degrees

Celsius), and nights can be surprisingly cool. Although winter nights are often colder than freezing, daytime temperatures are typically moderate.

PARK VISITATION

Annual park visitation from 1991 to 2000, ranged from 605,312 to 935,185 visitors. Visitation was relatively high in the early 1990s, peaked in 1995, and has declined each until 2003.

A recent visitor study provides useful information on park visitors (Delost and Lee 2001). Petrified Forest National Park is generally not the primary trip destination for most visitors. The most common other places visitors went on the same trip, or were planning to visit, were Grand Canyon National Park and Meteor Crater. Nearly 80% of visitors are visiting the park for the first time. Two-thirds of all visits to the park last between one and three hours. Average group size is three people, but commercial bus tours also stop at the park.

HISTORIC STRUCTURES

The Agate Bridge and Puerco Pueblo comfort stations were constructed as combination checking and comfort stations in 1935 by Olds Lumber Company of Winslow, Arizona. They are one-story, sandstone block buildings with deep narrow windows. Originally, the two rooms of the structures were connected by covered breezeways that are now filled in with wood and stucco. The original flagstone floors and walkway are now concrete. Currently, a portion of each building is still used as a comfort station and the remainder is used for storage. Neither building is universally accessible and both suffer from rodent infestations (especially the Puerco Pueblo location). The Arizona SHPO determined these buildings ineligible for the NRHP due to significant alterations. As part of this project, the Agate and Puerco comfort stations will be "restored" to interpretive shelters, thus negating the reason for their ineligibility. Once the buildings are restored, the park will ask the Arizona SHPO to re-evaluate their eligibility.

Although the structures are not eligible for the NRHP, the park's list of classified structures states that the buildings (#56686 and #56687 on the list of classified structures) should be preserved and maintained.

Biotic Communities, Including Threatened and Endangered Species

This section describes the general biotic environment of the proposed project area. It includes vegetation, wildlife (birds, mammals, reptiles, and amphibians), and threatened and endangered species (including species of concern and designated critical habitat).

Vegetation. Vegetation in the project area is characterized as grassland and is dominated by species found in the shortgrass prairie of Petrified Forest National Park. Throughout the park, this plant community is recovering from previous disturbances associated with overgrazing. The recovering grassland vegetation that may be found in the proposed project area includes alkali sacaton (*Sporobolus airoides*), blue grama (*Bouteloua gracilis*), galleta grass (*Hilaria*

spp.), four-winged saltbush (*Atriplex* sp.), golden buckwheat (*Eriogonum flavum*), and Mormon tea (*Ephedra* spp.) (NPS 1992). Isolated, scattered, and sparse stands of one-seed juniper (*Juniperus monosperma*) also occur.

Wildlife. Birds, mammals, reptiles, and amphibians occur in all project areas. In general, species diversity is greatest near the Puerco sewage lagoons. The habitat in this area is the most structurally diverse and is near a water source.

Mammals— Nine small and four large mammal species were seen or trapped in the vicinity of the four sites during surveys associated with potential upcoming projects within the park (the project this environmental assessment covers and the rehabilitation of the Painted Desert Inn). These include 56 small mammals and over eight individual large mammals. The most common small mammal detected at all the sites was the white-tailed antelope ground squirrel (*Ammospermophilus leucurus)* (26 individuals), followed by the harvest mouse (*Reithrodontomys megalotis)* (nine individuals). White-throated woodrat (*Neotoma albigula*), bushy-tailed woodrat (*Neotoma cinerea*), northern grasshopper mouse (*Onchomys leucogaster*), silky pocket mouse (*Perognathus flavus*), brush mouse (*Peromyscus boylii*), deer mouse (*Peromyscus maniculatus*), white-footed mouse (*Peromyscus leucopus*), Pinyon mouse (*Peromyscus truei*), and Ord's kangaroo rat (*Dipodomys ordii*) have also been observed in the proposed project areas (Nowak 2002).

The most common larger mammal at all sites, especially in the developed areas, was the desert cottontail rabbit (*Sylvilagus audubonii)*. This species' population has reached immense proportions in the Painted Desert headquarters complex area. Other large animals noted were mule deer (*Odocoileus hemionus*), black-tailed jackrabbit (*Lepus californicus*), bobcat (*Lynx rufous*), and porcupine (*Erethizon dorsatum*). Coyotes (*Canis latrans)* were not documented, but it is likely that they are present in all areas (Nowak 2002).

No particularly rare or sensitive mammal species were detected during surveys associated with the sewage system rehabilitation. However, it was noted that "the Arizona Game and Fish Department has recently expressed an interest in determining the range of the *Perognathus flavus goodpasteri* subspecies of silky pocket mouse that occurs at Petrified Forest"(Nowak 2002). This species was found at the Painted Desert headquarters complex area.

Reptiles and Amphibians— A total of three amphibian species (two individual amphibians) and seven reptile species (137 lizards and one snake) were found at the four proposed sewage line construction locations. The amphibians were the Great Plains toad (*Bufo cognatus*) and southern spadefoot (*Spea multiplicata*). Other amphibians known to occur in the proposed project area are the plains spadefoot (*Spea bombifrons*) and Woodhouse toad (*Bufo woodhousei*) (Nowak 2002).

The most common reptile observed at all the sites was the plateau striped whiptail (*Cnemidophorus velox*) (67 individuals). Eastern fence lizards (*Sceloporus undulatus*) were the next most widely distributed and abundant species (29 individuals). Other reptiles known to occur in the project area are the side-blotched lizard (*Uta stansburiana*), eastern fence lizard (*Sceloporus undulatus*), sagebrush lizard (*Sceloporus graciosus*), collared lizard (*Crotaphytus collaris*), plateau striped whiptail (*Cnemidophorus velox*), lesser earless lizard (*Holbrookia maculata*), short-horned lizard (*Phrynosoma douglasii*) gopher snake (*Pituophis catenifer*),

Hopi rattlesnake (*Crotalus viridis nuntius*), common kingsnake (*Lampropeltis getula*), striped whipsnake (*Masticophis taeniatus*), and milk snake (*Lampropeltis triangulum*) (Nowak 2002).

The area between the escarpment at Puerco Pueblo and the Puerco River is recognized as important breeding habitat for amphibians. The Puerco sewage ponds and adjacent compacted low-lying areas currently provide an important long-lasting water source that is critical to the successful reproduction of toads (*Bufo spp.*) and tiger salamanders (*Ambystoma tigrinum*). Although these breeding areas are a result of recent human construction, it is likely that amphibians have become dependent on these artificial habitats as natural water sources have disappeared due to draw-down of the water table and the Puerco River (Nowak 2002).

Birds— The park is host to a variety of bird species, both resident and migrant. Their status in the park has been listed as uncommon migrant, rare year-round resident, rare (resident status unknown), uncommon summer resident (breeding), common winter and summer resident, and common year-round resident. The most common birds in the area of the project are the white-crowned sparrow (*Zonotrichia leucophrys),* Say's phoebe (*Sayornis saya),* rock wren *(Salpinctes obsoletus),* Loggerhead shrike *(Lanius ludovicianus),* house finch *(Carpodacus mexicanus),* and dark-eyed junco (*Carpodacus mexicanus).* Appendix 3 is a list of bird species observed near the Puerco sewage lagoons (Nowak and Hart 2001).

Threatened and Endangered Species

Under the Endangered Species Act of 1973, as amended, an endangered species is defined as any species in danger of extinction throughout all or a significant portion of its range. A threatened species is defined as any species likely to become an endangered species in the foreseeable future throughout all or a significant portion of its range.

The U.S. Fish and Wildlife Service was contacted for an inventory of threatened, endangered, or candidate species under the Endangered Species Act that may potentially occur in the project area. Through consultation and surveys, it has been determined that there are no federally threatened or endangered species in the project area (Nowak 2002).

According to the Arizona Game and Fish Department, the giant sand treader cricket (*Dihinibaenetes Arizonensis*), an Arizona state species of special concern, is believed to occur at Chinde Point and the Painted Desert headquarters complex (Schwartz 2003). However, no populations have been identified within the park thus far. Suitable soil and geologic conditions exist near the Painted Desert headquarters complex, Chinde Point, Puerco Pueblo and Agate Bridge to support gladiator milk-vetch (*Astragulus xiphoides*), another species of special concern (Schwartz 2003). The gladiator milk-vetch requires management action only when the species occurs on U.S. Forest Service lands under the 1993 Arizona Native Plant Law (Arizona National Heritage Program 2002). The park limits disturbance to these species out of respect for state programs.

There is no designated critical habitat at Petrified Forest National Park.

Visitor Use and Experience

Monthly visitation peaks in July, but visitor numbers are high throughout the summer months. An increase in visitation is usually noted from mid-December until mid-January as people travel during the holidays. During spring and autumn months, visitation by school groups and senior citizens traveling by bus, recreational vehicle, and car increases.

Most visitors come in family groups that include children or adolescents. Average group size is just over three people. About one-quarter of groups include a member over 65 years of age. About three-quarters of all visitors are visiting the park for the first time. Average length of stay in the park is 2.4 hours. About 10% of visitors are Arizona residents, and California is the next most common state of residence (Roggenbuck et al. 1997).

Seeing petrified wood and viewing the Painted Desert are the two most common reasons people give for visiting the park. Eighty-five percent of visitors stop at Painted Desert overlooks. More than half also stop to enjoy the following park locations: Painted Desert Inn, Painted Desert visitor center, Puerco Pueblo, Newspaper Rock, Jasper Forest, Blue Mesa, Rainbow Forest Museum, Crystal Forest, Giant Logs, and Long Logs (Delost and Lee 2001).

The Agate Bridge and Chinde Point comfort stations do not have electricity, thus must be closed in the winter to prevent pipes from freezing. Chinde Point is used by school groups and also must be closed during the winter months. The Puerco Pueblo restrooms are open year round. The Puerco Pueblo and Agate Bridge comfort stations do not meet current American Disabilities Act requirements and, therefore, limit access for some populations.

Park Operations

The park maintenance staff is responsible for the operation and maintenance of all park facilities and equipment, including: utilities (water, wastewater, power, and solid waste), structures and grounds, frontcountry and backcountry visitor use areas, trail systems, picnic areas, roads, park signs, vehicles, and custodial services.

The park custodial staff consists of two permanent and two summer seasonal employees. The restroom facilities are cleaned once a day and checked once a day. Cleaning the restroom facilities takes approximately 30 minutes each (pers. comm., Petrified Forest National Park custodial staff, 2002). The structures do not have impervious surfaces and are difficult to clean. The comfort stations are dark and gloomy. The disposal system at Puerco Pueblo backs up occasionally and overflows into the restroom.

The lagoon at Rainbow Forest and Painted Desert headquarters complex are not operating optimally because there is not enough water and material flowing into them. As a result, the bacterial breakdown of sewage is not efficient and the lagoons must be dredged (scraped out) more often. Adding more material and water would allow better function, as will the installation of commutators and aeration systems. The lagoons at Puerco Pueblo, which only receive sewage from the Puerco Pueblo comfort station, are in poor repair. The liners are badly torn in two of the three cells. These lagoons also do not function optimally.

Health and Safety

Agate Bridge and Puerco Pueblo comfort stations (figure 10) do not have impervious surfaces and are difficult to clean, which creates a health hazard to the visiting public and park maintenance staff. The Puerco Pueblo comfort station has had rodent infestation, also causing a potential hazard to public and staff. The disposal systems at the comfort stations occasionally back up and overflow into the restroom, which also creates a potential health hazard to the public and park staff.

Park maintenance staff is at risk when wastewater pipes break due to the hazards of pipeline excavation and working in open trenches during repair activities.

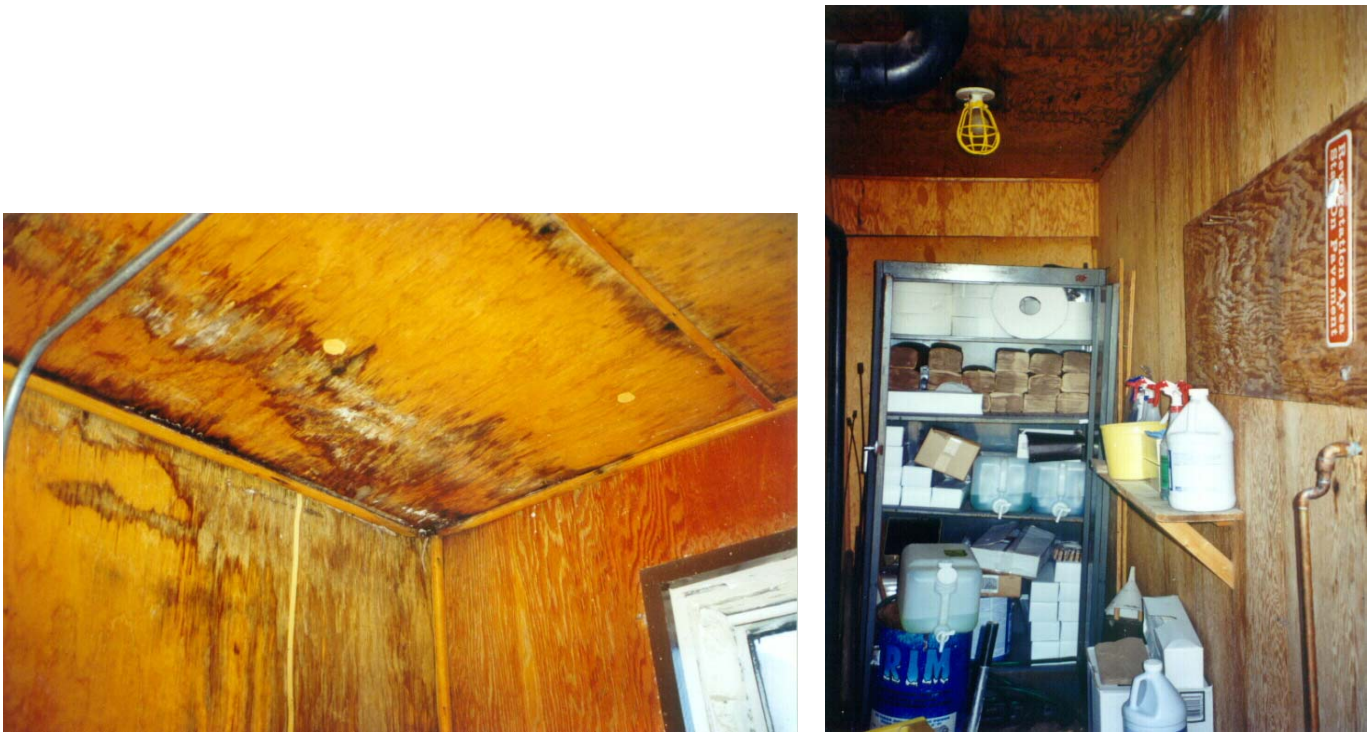

FIGURE 10. INTERIOR OF PUERCO PUEBLO COMFORT STATION

ENVIRONMENTAL CONSEQUENCES

INTRODUCTION

This section describes the environmental consequences of the no-action and the preferred alternatives. First, the methods for assessing environmental consequences are discussed. NEPA requires consideration of context, intensity, and duration of impacts, cumulative impacts, and measures to mitigate impacts. Next, is an explanation of resource impairment, which must also be assessed by alternative, according to National Park Service policy. Subsequent sections in this chapter are organized by impact topic, first for the no-action alternative, then for the National Park Service preferred alternative.

METHODS FOR ASSESSING IMPACTS

Overall, the National Park Service has based impact analyses and conclusions on the review of existing literature and park studies, information provided by park staff, professional judgments and insights of other agencies and officials (e.g., the Arizona SHPO), and input from interested local tribes and the public. Definitions used to evaluate the context, intensity, duration, and cumulative nature of impacts associated with project alternatives are discussed below.

Context is the setting within which an impact is analyzed, such as the affected region, society as a whole, the affected interests, and/or a locality. In this environmental assessment, the intensity of impacts are evaluated within a local (i.e., project area) context, while the intensity of the contribution of effects to cumulative impacts are evaluated in a regional context.

For this analysis, *impact intensity* or severity is defined as follows:

Historic Structures

- Negligible − the impact is at the lowest levels of detection − barely perceptible and not measurable
- Minor − impact would not affect the character-defining features of a structure
- Moderate – impact would alter a character-defining feature(s) of the structure or district, but would not diminish the historic integrity of the structure
- Major – impact would alter a character-defining feature(s) of the structure to the extent that it loses its historic integrity

Biotic Communities

- Negligible – an action that could affect biotic communities or threatened and endangered species habitat, but the change would be so small that it would not be of any measurable or perceptible consequence
- Minor – an action that could affect biotic communities or threatened and endangered species habitat, but the change would be slight and localized with few measurable consequences, and would not jeopardize a threatened and endangered species
- Moderate – an action that would result in readily apparent changes to affect biotic communities or threatened and endangered species habitat with measurable consequences
- Major – a severely adverse or exceptionally beneficial effect to biotic communities or threatened and endangered species habitat or species would result

Visitor Use and Experience

- Negligible – the impact is barely detectable and/or would affect few visitors
- Minor - the impact is slight, but detectable, and/or would affect some visitors
- Moderate – the impact is readily apparent and/or would affect many visitors
- Major – the impact is severely adverse or exceptionally beneficial and/or would affect the majority of visitors

Park Operations

- Negligible – change to park operations would be so small that there would be no measurable or perceptible consequence
- Minor – change to park operations would be slight and localized, with few measurable consequences
- Moderate – readily apparent changes to park operations with measurable consequences would result
- Major – a severely adverse or exceptionally beneficial change in park operations would result

Health and Safety

- Negligible – the impact to human health and safety would be so small that it would not be of any measurable or perceptible consequence
- Minor – the impact to human health and safety would be slight and localized, with few measurable consequences
- Moderate – the result is readily apparent—changes to human health and safety with measurable consequences
- Major – the result is a severely adverse or exceptionally beneficial effect to human health and safety

The *duration* of the impacts in this analysis is defined as follows:

- *Short term* – impacts occur only during construction or last less than one year
- *Long term* – impacts last longer than one year

Cumulative Impacts. Council on Environmental Quality regulations, which implement NEPA, require assessment of cumulative impacts in the decision-making process for federal projects. Cumulative impacts are defined as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (federal or non-federal) or person undertakes such other actions" (40 CFR 1508.7). Cumulative impacts are considered for both the no-action and preferred alternative.

Cumulative impacts were determined by combining the impacts of the alternatives with other past, present, or reasonably foreseeable future actions. It was, therefore, necessary to identify past, ongoing, or reasonably foreseeable future actions in the area of the national park. Petrified Forest National Park has recently revised its 1992 *General Management Plan (*NPS 2004). Based on the general management plan revision, the following actions are considered past, present, or reasonably foreseeable future actions:

- replacement of Jim Camp Wash bridge (completed in 2002)
- rehabilitation of Painted Desert Inn (2004 – 2005)
- installation and repair of south water line (2003)
- construction of new trails and wayside exhibits (future)

IMPAIRMENT OF PARK RESOURCES AND VALUES

In addition to determining the environmental consequences of the proposed action and alternatives, the 2001 *NPS Management Policies* (NPS 2001A) and Director's Order–12 require analysis of potential effects to determine if actions would impair park resources. The fundamental purpose of the national park system, established by the Organic Act and reaffirmed by the General Authorities Act, as amended, begins with a mandate to conserve park resources and values. National Park Service managers must seek ways to avoid, or minimize to the greatest degree practicable, adversely impacting park resources and values. Congress has given National Park Service managers discretion, however, to allow impacts to park resources and values when necessary and appropriate to fulfill the purposes of a park, so long as the impact does not constitute impairment of the affected resources and values.

The prohibited impairment is an impact that would, in the professional judgment of the responsible National Park Service manager, harm the integrity of park resources or values, including opportunities that would otherwise be present for the enjoyment of those resources or values. An impact would be more likely to constitute an impairment to the extent that it has a major or severe adverse effect upon a resource or value whose conservation is as follows:

- Necessary to fulfill specific park purposes identified in the establishing legislation or proclamation of the park.

- Key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park.
- Identified as a goal in the park's *General Management Plan* or other relevant National Park Service planning documents.

A determination on impairment is made in the "Conclusion" section of most impact topics of this document. Impairment statements are not required for health and safety or park operations topics.

ENVIRONMENTAL CONSEQUENCES-—ALTERNATIVE A: NO ACTION

Historic Structures

There would be no new impacts to historic structures should the no-action alternative be implemented.

Cumulative Impacts. The no-action alternative would not contribute to cumulative effects on historic structures.

Conclusion. There would be no new impacts resulting from the no-action alternative. The no-action alternative would not contribute to cumulative impacts.

Because there would be no major adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the park's establishing legislation, (2) key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park, or (3) identified as a goal in the park's *General Management Plan* or other relevant National Park Service planning documents, there would be no impairment of park resources or values.

Biotic Communities, Including Threatened and Endangered Species

There would be no new impacts to biotic communities (vegetation, wildlife, and threatened, endangered, or sensitive species) should the no-action alternative be implemented.

Cumulative Impacts. A variety of past, present, and reasonably foreseeable actions have affected and will continue to affect biotic communities at Petrified Forest National Park. Livestock grazing, which occurred in the park until 1962, resulted in fragmented shortgrass prairie remnants. Human activities such as construction and maintenance of buildings, roads, and visitor facilities have resulted in localized disturbance of biotic communities. Examples at Petrified Forest National Park include the past project to replace the Jim Camp Wash bridge and potential future activities associated with building renovations at Painted Desert Inn, south waterline repairs, and new trails and wayside exhibits. The no-action alternative would not contribute to cumulative effects on biotic communities.

Conclusion. There would be no new impacts resulting from the no-action alternative. The no-action alternative would not contribute to cumulative effects on biotic communities.

Because there would be no major adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the park's establishing legislation, (2) key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park, or (3) identified as a goal in the park's *General Management Plan* or other relevant National Park Service planning documents, there would be no impairment of park resources or values.

Visitor Use and Experience

The no-action alternative would leave the comfort facilities and disposals systems in their present condition. Most comfort facilities would still close during the winter months, creating inconveniences to park visitors. Occasional sewage backups would still occur, also causing temporary closures of the facilities, particularly on weekends when full-time park staff is not available for making repairs. Certain populations would continue to have difficulty accessing the facilities. There would be no change in direct or indirect impacts on visitor experience under this alternative; however, the existing condition of the comfort stations constitutes a long-term, minor, adverse impact to visitor use and experience.

Cumulative Impacts. Past and reasonably foreseeable future actions affecting visitor experience include the past project to replace Jim Camp Wash Bridge, and proposed future rehabilitation of Painted Desert Inn, installation and repair of the south waterline, and construction of new trails and wayside exhibits. All of these proposed actions would have a long-term, beneficial effect on visitor use and experience. The no-action alternative would contribute a minor, long-term, adverse, cumulative effect to visitor use and experience, but the overall long-term impacts to visitor use and experience would be beneficial.

Conclusion. There would be no change in direct or indirect impacts on visitor experience from the no-action alternative. However, the existing condition represents long-term, minor, adverse impacts to visitor experience. The overall cumulative effects would be long term and beneficial.

Park Operations

The no-action alternative would leave the comfort facilities and disposal systems in their present condition. Custodial staff would continue cleaning the facilities as currently scheduled and making repairs as necessary; lagoons would continue to operate less than optimally, and the septic tank at Puerco Pueblo would continue to occasionally overflow; and the septic tank at Agate Bridge would most likely begin to overflow, requiring increased maintenance and repair. There would be no change in direct or indirect impacts to park operations under this alternative. However, the existing condition of the comfort stations constitutes a long-term, minor to moderate, adverse impact to park operations.

Cumulative Impacts. Past and reasonably foreseeable future actions affecting park operations include the past project to replace Jim Camp Wash Bridge, and proposed future rehabilitation of Painted Desert Inn, installation and repair of the south waterline, and construction of new trails and wayside exhibits. The replacement of Jim Camp Wash Bridge, rehabilitation of

Painted Desert Inn, and installation and repair of the south waterline would have a beneficial effect on park operations by reducing repairs and maintenance to these facilities. The construction of new trails would have a long-term, negligible impact on park operations because these trails would need to be maintained. The no-action alternative would contribute a minor to moderate, long-term, adverse, cumulative effect to park operations. The overall impacts to park operations from the no-action alternative in conjunction with the past, present, and reasonably foreseeable future projects would be long term, negligible, and adverse.

Conclusion. There would be no change in direct or indirect impacts to park operations under this alternative. However, the existing condition of the comfort stations constitutes a long-term, minor to moderate, adverse impact to park operations. The cumulative effect of the no-action alternative, combined with other reasonably foreseeable construction projects, would be long term, adverse, and negligible in intensity.

Health and Safety

National Park Service Director's Order – 83: *Public Health*, directs that park managers reduce the risk of waterborne diseases and provide safe wastewater disposal by ensuring wastewater systems are properly operated, maintained, monitored, and deficiencies promptly corrected. There is contamination risk when septic tanks backup and overflow, either into the comfort stations or onto the ground. In the no-action alternative, the risk of contamination would remain relatively low, but cause a long-term, minor, adverse impact on human health.

Excavating trenches are necessary whenever buried utilities, including sewerlines, are constructed or repaired. Accident statistics compiled by the Occupational Safety and Health Administration (OSHA) show that trenching and excavation are among the most dangerous activities in the construction industry. Each year 100 to 400 people are killed and another 1,000 to 4,000 injured in trenching and shoring mishaps (OSHA 2002b). There have been no "lost-time" accidents at the park related to pipeline repairs thus far. Provided OSHA standards for excavating and trenching are followed during wastewater line repair activities, the risk of an accident would remain low, constituting a long-term, negligible, adverse impact on human safety.

Cumulative Impacts. Past and reasonably foreseeable future actions affecting health and safety include the past replacement of Jim Camp Wash Bridge, and proposed future rehabilitation of Painted Desert Inn, and installation and repair of the south waterline. These proposed actions would have a beneficial effect on health and safety. The no-action alternative would contribute a long-term, negligible to minor, adverse, cumulative effects to human health and safety and the overall cumulative impacts to health and safety would be negligible and adverse.

Conclusion. The no-action alternative would have negligible to minor, adverse impacts on human health and safety from contamination risk and construction hazards. Cumulative impacts would be long term, adverse, and negligible in intensity.

ENVIRONMENTAL CONSEQUENCES—ALTERNATIVE B: PREFERRED ALTERNATIVE

Historic Structures

Under the preferred alternative at Puerco Pueblo and Agate Bridge, the existing comfort station would be restored/rehabilitated into an interpretative shelter by removing all infill construction and plumbing fixtures and opening the original fenestration on the east and west walls. In effect, the structures would be returned to their historic profile. Moreover, they would be much easier to preserve because they would not be subjected to regular use, modifications, and maintenance activities associated with their role as comfort stations. This would directly affect the structures in a beneficial way. The intensity and duration of the impact would be moderate and long term.

Cumulative Impacts. A variety of past, present, and reasonably foreseeable actions have negatively affected and will continue to negatively affect the historic structures throughout the park. Over the years, modifications have altered the historic fabric of the buildings and structures. Reasonably foreseeable future impacts to historic structures include the rehabilitation of the Painted Desert Inn, which will have a beneficial impact to historic structures. The preferred alternative would have a moderate, beneficial impact on historic structures. Therefore, cumulative impacts would be long term, negligible, and beneficial on historic structures.

Conclusion. The preferred alternative would result in a direct, long-term, moderate benefit to historic structures. The cumulative effect of the preferred alternative in association with other past, present, and reasonably foreseeable future impacts would be long term, negligible, and beneficial on historic structures.

Because there would be no major adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the park's establishing legislation, (2) key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park, or (3) identified as a goal in the park's *General Management Plan* or other relevant National Park Service planning documents, there would be no impairment of park resources or values.

Biotic Communities, Including Threatened and Endangered Species

Aspects of this project with potential to impact biotic communities include: (1) replacing sections of sewerline at Rainbow Forest and the Painted Desert headquarters complex; (2) rehabilitating the sewage lagoons, and (3) activities associated with the construction of the new Puerco Pueblo and Agate Bridge comfort stations.

Excavations, trenching, and hand digging that would be associated with the replacement of sewerlines and construction of the Puerco Pueblo and Agate Bridge comfort stations would require clearing of vegetation. Vegetation would also be directly affected by compaction from construction equipment, stored materials, human trampling, or temporarily displaced soils. Indirect effects on vegetation would result from soil compaction. Plant seedlings tend not to

penetrate compacted soil and usually die before becoming established. In addition, water and air pass more slowly through compacted soils, thus increasing seedling mortality.

Several measures would be taken to mitigate the direct and indirect impacts noted, however. These include selective positioning for equipment staging and material storage, defining construction zones, and returning topsoil to disturbed areas when the project is completed (refer to "Mitigation Measures for the Preferred Alternative" in the "Alternatives" chapter for a detailed discussion of steps that would be taken). As a result of implementing this alternative and the mitigation measures discussed, short-term (duration of the project until vegetation is reestablished), minor, adverse impacts on vegetation would be expected.

During construction, some wildlife would be temporarily disturbed or displaced, including some small animals (e.g., mice, reptiles, and amphibians) that may be killed or forced to relocate outside the project area. This displacement may reduce populations slightly during construction, but once the project was completed and mitigation measures employed, wildlife would be expected to reoccupy the area. Larger species (e.g., coyote, pronghorn) would probably avoid the project site altogether during the construction phase. Therefore, implementing this alternative is expected to have short-term (duration of the project and habitat restoration), minor, adverse impacts on wildlife.

Some area will be covered by the new comfort stations at Puerco Pueblo and Agate Bridge, resulting in a long-term, negligible, adverse impact to vegetation.

Vegetation clearing and compaction and soil compaction associated with construction may affect potential gladiator milk-vetch (a species of special concern) habitat. This is very unlikely, however, because potentially suitable habitat only occurs to a limited extent in the project area and is subject only to localized disturbance. Therefore, with appropriate mitigation measures (e.g., avoiding the potentially suitable gladiator milk-vetch habitat altogether, using hand digging if necessary, or transplanting individual plants to another suitable location) implementing this alternative should result in no adverse impacts to threatened, endangered, or special concern species, or to their habitat.

Cumulative Impacts. A variety of past, present, and reasonably foreseeable actions have affected and will continue to affect biotic communities at Petrified Forest National Park. Livestock grazing, which occurred in the park until 1962, resulted in fragmented shortgrass prairie remnants. Human activities such as construction and maintenance of buildings, roads, and visitor facilities have resulted in localized disturbance of biotic communities. Examples at Petrified Forest National Park include the completed project to replace the Jim Camp Wash bridge and potential future activities associated with building renovations at Painted Desert Inn, the south waterline repairs, and new trails and wayside exhibits.

The preferred alternative would have negligible, beneficial, cumulative effects on vegetation and wildlife, and no cumulative impacts on threatened and endangered species or their habitat.

Conclusion. This alternative is expected to have localized, short-term, minor, adverse impacts on biotic communities at the park during the project. Long-term, minor, localized,. There would be no impact to threatened and endangered species or their habitat. A cumulative beneficial effect would result for vegetation and wildlife.

Because there would be no major adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the park's establishing legislation, (2) key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park, or (3) identified as a goal in the park's *General Management Plan* or other relevant National Park Service planning documents, there would be no impairment of park resources or values.

Visitor Use and Experience

Visitors may be temporarily inconvenienced by construction activities during the changeover of new comfort stations. Construction work would be scheduled, as feasible, to minimize impacts on visitors resulting in a short-term, negligible, adverse impact. Once construction is complete, the comfort stations would be open year-round and closures would be less frequent, if not eliminated. Facilities would also be accessible to the majority of park visitors. Facilities would also be easier to clean and receive more light, improving the facilities for visitor use.

Over the long term, proposed actions would have a minor to moderate, beneficial effect on visitor use and experience.

Cumulative Impacts. Past, present, and reasonably foreseeable future actions affecting visitor experience include the past project to replace Jim Camp Wash Bridge, and proposed future projects for the rehabilitation of Painted Desert Inn, installation and repair of the south waterline, and construction of new trails and wayside exhibits. These proposed actions would have a beneficial effect on visitor use and experience. The preferred alternative would contribute a minor, beneficial, long-term, cumulative effect to visitor use and experience.

Conclusion. There would be short-term, negligible, adverse impacts to visitor use and experience during construction. However, once construction was complete, there would be a long-term, minor to moderate, beneficial effect on visitor use and experience. Cumulative effects would be long term, minor, and beneficial.

Park Operations

Once construction is complete, the new comfort stations would take less time to clean than the existing stations. There would be no change in the frequency of cleaning or inspections. Once the repairs are completed, the Painted Desert headquarters complex, Puerco Pueblo, and Rainbow Forest lagoons would operate at a more optimal level, reducing the frequency of dredging, repairs, and maintenance.

The preferred alternative would have a short- and long-term, minor to moderate, beneficial impact on park operations.

Cumulative Impacts. Past and reasonably foreseeable future actions affecting park operations include the past replacement of Jim Camp Wash Bridge, and proposed future rehabilitation of Painted Desert Inn, installation and repair of the south waterline, and construction of new trails and wayside exhibits. The replacement of Jim Camp Wash Bridge, rehabilitation of

Painted Desert Inn, and installation and repair of the south waterline would have a beneficial effect on park operations by reducing maintenance and repairs to these facilities. The construction of new trails would have a long-term, minor impact on park operations because these trails would need to be maintained. The preferred alternative would contribute a long-term, minor, and beneficial cumulative effect to park operations.

Conclusion. There would be some long-term, minor to moderate, beneficial effects to park operations. Cumulative impacts would be long term, minor, and beneficial.

Health and Safety

Under this alternative, the contamination risk from septic tank overflow would be eliminated, providing a long-term, minor, beneficial effect on human health. Although the risk of contamination cannot be completely eliminated in the restrooms, the impervious surfaces would provide for a more sanitary environment. Therefore, the impacts to human health would be long term, minor, and beneficial.

Between the Rainbow Forest concessions building and the Rainbow Forest sewage lagoon, a new pipe would be placed in the existing trench. As much as 1,300 feet of pipe could require removal. Safety risks from working in excavation and trenching would be short-term and negligible, provided that OSHA standards are followed during removal and repair activities.

Cumulative Impacts. Past and reasonably foreseeable future actions affecting health and safety include the past replacement of Jim Camp Wash Bridge, and proposed future rehabilitation of Painted Desert Inn, and installation and repair of the south waterline. These proposed actions would have a long-term beneficial effect on health and safety. The preferred alternative would contribute a long-term, negligible to minor, beneficial, cumulative effect to human health and safety.

Conclusion. The preferred alternative would have a short-term, negligible, and adverse impact to construction workers during construction. However, once the project is completed, the effects to human safety and health would be long-term, negligible to minor, and beneficial. Cumulative impacts would be long term, beneficial, and negligible to minor in intensity to human health and safety.

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- National Parks Omnibus Management Act of 1998, P.L. 105-391, Title IV, National Park Service Concessions Management Improvement Act of 1998
- Archeological Resources Protection Act of 1979, P.L. 96-95, 93 Stat. 712, 16 USC § 470aa *et seq.* and 43 CFR 7, subparts A and B, 36 CFR 79
- Executive Order 13007: Indian Sacred Sites, May 24, 1996
- Management of Museum Properties Act of 1955, P.L. 84-127, 69 Stat. 242, 16 USC § 18f
- National Historic Preservation Act as amended, P.L. 89-665, 80 Stat. 915, 16 USC § 470 *et seq.* and 36 CFR 18, 60, 61, 63, 68, 79, 800
- Native American Grave Protection and Repatriation Act, P.L. 101-601, 104 Stat. 3049, 25 USC §§ 3001-3013
- Clean Air Act, as amended, P.L. Chapter 360, 69 Stat. 322, 42 USC § 7401 *et seq.*
- Endangered Species Act of 1973, as amended, P.L. 93-205, 87 Stat. 884, 16 USC § 1531 *et seq.*

- Executive Order 11991: Protection and Enhancement of Environmental Quality
- Federal Water Pollution Control Act (commonly referred to as Clean Water Act), P.L. 92-500, 33 USC § 1251 *et seq.*, as amended by the Clean Water Act, P.L. 95-217
- National Environmental Policy Act of 1969, P.L. 91-190, 83 Stat. 852, 42 USC § 4321 *et seq.*
- Protection and Enhancement of Environmental Quality, E.O. 11514, as amended, 1970, E.O. 11991, 35 *Federal Register* 4247; 1977, 42 *Federal Register* 26967)
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- Executive Order 13045, Protection of Children from Environmental Health and Safety Risks
- Executive Order 12898, Environmental Justice

National Park Service Orders and Guidance

- Director's Order–2, *Planning Guidelines*
- Director's Order –12, *Conservation Planning, Environmental Impact Analysis and Decision-making*
- Director's Order–24, *National Park Service Museum Collections Management*
- Director's Order –28, *Cultural Resource Management Guideline*
- Director's Order–47, *Sound Preservation and Noise Management*
- Director's Order – 77, *Natural Resource Management Guideline*
- Director's Order–83, *Public Health*
- 2001 Management Policies

CONSULTATION AND COORDINATION

Agencies and organizations contacted for information; or that assisted in identifying important issues, developing alternatives, or that will be given an opportunity to review and comment on this environmental assessment include the following:

FEDERAL AGENCIES

Office of Navajo and Hopi Indian Relocation
U.S. Army Corps of Engineers
U.S. Department of Agriculture – Natural Resources Conservation Service
U.S. Fish and Wildlife Service
U.S. Geological Survey

TRIBES

Dilkon Chapter of the Navajo
Hopi Tribe
Indian Wells Chapter of the Navajo
Klagetoh Chapter of the Navajo
Lower Greasewood Chapter of the Navajo
Nahatadzill Chapter of the Navajo
Navajo Nation
Pueblo of Zuni
Wide Ruins Community Chapter of the Navajo
White Mountain Apache Tribe

STATE AND LOCAL AGENCIES

Apache County Board of Supervisors
Arizona Department of Environmental Quality
Arizona Game and Fish Department
Arizona State Parks – State Historic Preservation Office
City of Holbrook
Navajo County Board of Supervisors

OTHER ORGANIZATIONS

Grand Canyon Trust
Little Colorado River Plateau R.C.&D
National Parks and Conservation Association
White Mountain Audubon Society
Xanterra Parks and Resorts

PREPARERS

This environmental assessment was prepared by engineering-environmental Management, Inc., under the direction of Ms. Karen Beppler-Dorn, Chief of Resource Management, Petrified Forest National Park. Ms. Beppler-Dorn and Petrified Forest National Park staff (especially Bill Yetts, Pat Thompson, and Amanda Zennan), and Denver Service Center Staff (Phil Ayers) provided invaluable assistance in the development and technical review of this environmental assessment. The individuals who prepared this document are listed below:

Jayne Aaron, Environmental Planner
M.A. Environmental Policy and Management
B.A. Environmental Design
Years of Experience: 11

Chris Baker, Cultural Resources Specialist
M.A. History and Public History
B.A. History
Years of Experience: 4

Jim Von Loh, Senior Biologist
M.S. Biology
B.S. Biology
Years of Experience: 25

Wanda Gray Lafferty, Technical Publications Specialist
Two years undergraduate study
Years of Experience: 27

APPENDIX 1

NATIONAL PARK SERVICE PRESS RELEASE

National Park Service
U.S. Department of the Interior

Petrified Forest National Park

P.O. Box 2217
1 Park Road
Petrified Forest, AZ 86028
(928)524-6228 phone
(928)524-3567 fax

Petrified Forest N.P. News Release

Release date: Immediate

Contact(s): Karen Beppler-Dorn

Phone number: 928-524-6228 x263

Date: February 4, 2003

Release code: **NPS**

PUBLIC COMMENTS ARE SOUGHT ON PROPOSED SEWER LINE REHABILITATION PROJECT AND VAULT TOILET INSTALLATION

Petrified Forest, AZ – Petrified Forest National Park officials today announced plans to rehabilitate the sewer lines at the Rainbow Forest and Painted Desert Headquarters developed areas, and the installation of vault toilet facilities at Chinde Picnic Area, Puerco Pueblo tour stop, and the Agate Bridge or the Jasper Forest tour stop. As a result of this project, the sewage lagoons near Puerco Pueblo would no longer be needed once vault toilets are installed. The National Park Service is proposing to remove the lagoons and re-contour the area in order to return it to a more natural condition. These facilities would help the park conserve water, reduce maintenance costs and eliminate health hazards associated with failing septic fields.

The sewer lines in the Rainbow Forest complex are thought to be about 30 years old. Tree roots and pipe breakage continue to plug the lines, causing sewage to backup, and necessitating that park staff dig them up to make repairs.

For more information call (928) 524-6228 weekdays, 8:00 a.m. to 4:00 p.m. Mountain Standard Time; or write to the Superintendent, Petrified Forest National Park, P.O. Box 2217, Petrified Forest, AZ 86028; or e-mail the park Superintendent at PEFO_Superintendent@nps.gov.

NPS

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APPENDIX 2

COORDINATION WITH TRIBES AND AGENCIES

THE STATE OF ARIZONA
GAME AND FISH DEPARTMENT
2221 WEST GREENWAY ROAD, PHOENIX, AZ 85023-4399
(602) 942-3000 • WWW.AZGFD.COM

GOVERNOR
JANE DEE HULL
COMMISSIONERS
CHAIRMAN, MICHAEL M. GOLIGHTLY, FLAGSTAFF
JOE CARTER, SAFFORD
SUSAN E. CHILTON, ARIVACA
W. HAYS GILSTRAP, PHOENIX
JOE MELTON, YUMA
DIRECTOR
DUANE L. SHROUFE
DEPUTY DIRECTOR
STEVE K. FERRELL

January 13, 2003

JAN 17 2003

Ms. Jayne Aaron
E2M
1510 W. Canal Ct.
Suite 2000
Littleton, CO 80120

Re: Special Status Species Information for **Township 20 North, Range 24 East, Section 33 (Chinde Point); Township 19 North, Range 24 East, Section 10 (Headquarters and Visitor Center); Township 18 North, Range 24 East, Section 9 (Puerco Pueblo); Township 17 North, Range 24 East, Section 9 (Agate Bridge); Township 16 North, Range 23 East, Section 1 (Giant Logs); Rehabilitation of Sewage Treatment and Disposal Systems and Facilities at Petrified Forest National Park.**

Dear Ms. Aaron:

The Arizona Game and Fish Department (Department) has reviewed your request, dated December 23, 2002, regarding special status species information associated with the above-referenced project area. The Department's Heritage Data Management System (HDMS) has been accessed and current records show that the special status species listed on the attachment have been documented as occurring in the project areas (3-mile buffer). Current records do not indicate the presence of any special status species as occurring in the Giant Logs project vicinity. In addition, these projects do not occur in the vicinity of any proposed or designated Critical Habitats.

The Department's HDMS data are not intended to include potential distribution of special status species. Arizona is large and diverse with plants, animals, and environmental conditions that are ever changing. Consequently, many areas may contain species that biologists do not know about or species previously noted in a particular area may no longer occur there. Not all of Arizona has been surveyed for special status species, and surveys that have been conducted have varied greatly in scope and intensity.

Making available this information does not substitute for the Department's review of project proposals, and should not decrease our opportunities to review and evaluate new project proposals and sites. The Department is also concerned about other resource

values, such as other wildlife, including game species, and wildlife-related recreation. The Department would appreciate the opportunity to provide an evaluation of impacts to wildlife or wildlife habitats associated with project activities occurring in the subject area, when specific details become available.

If you have any questions regarding this letter, please contact me at (602) 789-3618. General status information, county and watershed distribution lists and abstracts for some special status species are also available on our web site at http://www.azgfd.com/frames/fishwild/hdms_site/Home.htm.

Sincerely,

Sabra S. Schwartz
Heritage Data Management System, Coordinator

SSS:ss

cc: Bob Broscheid, Project Evaluation Program Supervisor
Sharen Adams, Habitat Program Manager, Region I

AGFD# 01-07-03(05)

Special Status Species within 3 Miles of T20N,R24E Sec 33

Arizona Game and Fish Department, Heritage Data Management System

January 13, 2003

Scientific Name	Common Name	ESA	USFS	BLM	WSCA	NPI
ASTRAGALUS XIPHOIDES	GLADIATOR MILK VETCH	SC				SR
DAIHINIBAENETES ARIZONENSIS	ARIZONA GIANT SAND TREADER CRICKET	SC	S	S		

No Critical Habitats in project area. AGFD #01-07-03(05), Petrified Forest National Park Rehabilitating Sewage treatmer disposal systems and facilities: Chinde Point.

Special Status Species within 3 Miles of T19N,R24E Sec 10

Arizona Game and Fish Department, Heritage Data Management System

January 13, 2003

Scientific Name	Common Name	ESA	USFS	BLM	WSCA	NPL
ASTRAGALUS XIPHOIDES	GLADIATOR MILK VETCH	SC				SR
DAIHINIBAENETES ARIZONENSIS	ARIZONA GIANT SAND TREADER CRICKET	SC	S	S		

No Critical Habitats in project area. AGFD #01-07-03(05), Petrified Forest National Park Rehabilitating Sewage treatment disposal systems and facilities: HQ.

Special Status Species within 3 Miles of T18N,R24E Sec 9

Arizona Game and Fish Department, Heritage Data Management System

January 13, 2003

Scientific Name	Common Name	ESA	USFS	BLM	WSCA	NPL
ASTRAGALUS XIPHOIDES	GLADIATOR MILK VETCH	SC				SR

No Critical Habitats in project area. AGFD #01-07-03(05), Petrified Forest National Park Rehabilitating Sewage treatment disposal systems and facilities: Puerco Pueblo.

STATUS DEFINITIONS

ARIZONA GAME AND FISH DEPARTMENT (AGFD)
HERITAGE DATA MANAGEMENT SYSTEM (HDMS)

FEDERAL US STATUS

ESA **Endangered Species Act** (1973 as amended)
US Department of Interior, Fish and Wildlife Service (http://arizonaes.fws.gov)

Listed

- **LE** Listed Endangered: imminent jeopardy of extinction.
- **LT** Listed Threatened: imminent jeopardy of becoming Endangered.
- **XN** Experimental Nonessential population.

Proposed for Listing

- **PE** Proposed Endangered.
- **PT** Proposed Threatened.

Candidate (Notice of Review: 1999)

- **C** Candidate. Species for which USFWS has sufficient information on biological vulnerability and threats to support proposals to list as Endangered or Threatened under ESA. However, proposed rules have not yet been issued because such actions are precluded at present by other listing activity.
- **SC** Species of Concern. The terms "Species of Concern" or "Species at Risk" should be considered as terms-of-art that describe the entire realm of taxa whose conservation status may be of concern to the US Fish and Wildlife Service, but neither term has official status (currently all former C2 species).

Critical Habitat (check with state or regional USFWS office for location details)

- **Y** Yes: Critical Habitat has been designated.
- **P** Proposed: Critical Habitat has been proposed.

[\N No Status: certain populations of this taxon do not have designated status (check with state or regional USFWS office for details about which populations have designated status)].

USFS **US Forest Service** (1999 Animals, 1999 Plants: corrected 2000)
US Department of Agriculture, Forest Service, Region 3 (http://www.fs.fed.us/r3/)

- **S** Sensitive: those taxa occurring on National Forests in Arizona which are considered sensitive by the Regional Forester.

BLM **US Bureau of Land Management** (2000 Animals, 2000 Plants)
US Department of Interior, Bureau of Land Management, Arizona State Office (http://azwww.az.blm.gov)

- **S** Sensitive: those taxa occurring on BLM Field Office Lands in Arizona which are considered sensitive by the Arizona State Office.
- **P** Population: only those populations of Banded Gila monster (*Heloderma suspectum cinctum*) that occur north and west of the Colorado River, are considered sensitive by the Arizona State Office.

STATE STATUS

NPL **Arizona Native Plant Law** (1999)
Arizona Department of Agriculture (http://agriculture.state.az.us/PSD/nativeplants.htm)

- **HS** Highly Safeguarded: no collection allowed.
- **SR** Salvage Restricted: collection only with permit.
- **ER** Export Restricted: transport out of State prohibited.
- **SA** Salvage Assessed: permits required to remove live trees.
- **HR** Harvest Restricted: permits required to remove plant by-products.

WSCA **Wildlife of Special Concern in Arizona** (1996 in prep)
Arizona Game and Fish Department (http://www.azgfd.com)

- **WC** Wildlife of Special Concern in Arizona. Species whose occurrence in Arizona is or may be in jeopardy, or with known or perceived threats or population declines, as described by the Arizona Game and Fish Department's listing of Wildlife of Special Concern in Arizona (WSCA, in prep). Species indicated on printouts as WC are currently the same as those in **Threatened Native Wildlife in Arizona** (1988).

Revised 10/3/01, AGFD HDMS
J:\HDMS\DOCUMENT\NBOOKS\TEMPLATE\EORDEFS\STATDEF

United States Department of the Interior
U.S. Fish and Wildlife Service
Arizona Ecological Services Field Office
2321 West Royal Palm Road, Suite 103
Phoenix, Arizona 85021-4951
Telephone: (602) 242-0210 Fax: (602) 242-2513

In Reply Refer to:

AESO/SE
02-21-03-I-0093

January 14, 2003

JAN 17 2003

Ms. Jayne Aaron, Project Manager
Engineering Environmental Management Inc.
1510 West Canal Court, Suite 2000
Littleton, Colorado 80120

RE: Rehabilitation of Sewage Treatment and Disposal Systems and Facilities at the Petrified Forest National Park

Dear Ms. Aaron:

Thank you for your recent request for information on threatened or endangered species, or those that are proposed to be listed as such under the Endangered Species Act of 1973, as amended (Act), which may occur in your project area. The Arizona Ecological Service Field Office has posted lists of the endangered, threatened, proposed, and candidate species occurring in each of Arizona's 15 counties on the Internet. Please refer to the following web page for species information in the county where your project occurs: **http://arizonaes.fws.gov**

If you do not have access to the Internet or have difficulty obtaining a list, please contact our office and we will mail or fax you a list as soon as possible.

After opening the web site, click the Threatened and Endangered button on the left hand side of the page. Then scroll to the bottom of the page where there is a map of Arizona. You can either click on your county of choice on the map or from the list. The arrows on the left will guide you through information on species that are listed, proposed, candidates, or have conservation agreements. Here you will find information on the species' status, a physical description, all counties where the species occurs, habitat, elevation, and some general comments. Additional information can be obtained by going back to the main page. On the left side of the screen, click on Document Library, then click on Documents by Species, then click on the name of the species of interest to obtain General Species Information, or other documents that may be available. Click on the cactus icon to view the desired document.

Please note that your project area may not necessarily include all or any of these species. The information provided includes general descriptions, habitat requirements, and other information for each species on the list. Under the General Species Information, citations for the Federal Register (FR) are included for each listed and proposed species. The FR is available at most

public libraries. This information should assist you in determining which species may or may not occur within your project area. Site-specific surveys could also be helpful and may be needed to verify the presence or absence of a species or its habitat as required for the evaluation of proposed project-related impacts.

Endangered and threatened species are protected by Federal law and must be considered prior to project development. If the action agency determines that listed species or critical habitat may be adversely affected by a federally funded, permitted, or authorized activity, the action agency will need to request formal consultation with us. If the action agency determines that the planned action may jeopardize a proposed species or destroy or adversely modify proposed critical habitat, the action agency will need to enter into a section 7 conference. The county list may also contain candidate species. Candidate species are those for which there is sufficient information to support a proposal for listing. Although candidate species have no legal protection under the Act, we recommend that they be considered in the planning process in the event that they become listed or proposed for listing prior to project completion.

If any proposed action occurs in or near areas with trees and shrubs growing along watercourses, known as riparian habitat, we recommend the protection of these areas. Riparian areas are critical to biological community diversity and provide linear corridors important to migratory species. In addition, if the project will result in the deposition of dredged or fill materials into waterways, we recommend you contact the Army Corps of Engineers which regulates these activities under Section 404 of the Clean Water Act.

The State of Arizona and some of the Native American Tribes protect some plant and animal species not protected by Federal law. We recommend you contact the Arizona Game and Fish Department and the Arizona Department of Agriculture for State-listed or sensitive species, or contact the appropriate Native American Tribe to determine if sensitive species are protected by Tribal governments in your project area. We further recommend that you invite the Arizona Game and Fish Department and any Native American Tribes in or near your project area to participate in your informal or formal Section 7 Consultation process.

For future projects, you do not need to contact our office to obtain a species list for a new project. However, for additional communications regarding this project, please refer to consultation number 02-21-03-I-0093. We appreciate your efforts to identify and avoid impacts to listed and sensitive species in your project area. If we may be of further assistance, please feel free to contact Tom Gatz for projects in northern Arizona or along the Colorado River (x240) or Sherry Barrett for projects in southern Arizona.

Sincerely,

for Steven L. Spangle
Field Supervisor

cc: John Kennedy, Habitat Branch, Arizona Game and Fish Department, Phoenix, AZ

APPENDIX 3

BIRD SPECIES KNOWN TO OCCUR AT PUERCO LAGOONS

Common Name	Scientific Name	Status in the Park
Audubon's warbler	*Dendroica coronata*	Uncommon migrant (spring or fall)
Brewer's sparrow	*Spizella breweri*	Rare year-round resident
Canyon towhee	*Pipilo fuscus*	Rare year-round resident
Dark-eyed junco	*Junco hyemalis*	Common winter resident
Horned lark	*Eremophila alpestris*	Common year-round resident
House finch	*Carpodacus mexicanus*	Common summer resident (breeding)
Killdeer	*Charadrius vociferous*	Uncommon summer resident (breeding)
Loggerhead shrike	*Lanius ludovicianus*	Common year-round resident
Northern flicker	*Colaptes auratus*	Uncommon summer resident (breeding)
Red-napped sapsucker	*Sphyrapicus nuchalis*	Rare (resident status unknown)
Rock wren	*Salpinctes obsoletus*	Common year-round resident
Ruby-crowned kinglet	*Regulus calendula*	Uncommon migrant (spring or fall)
Rufous-crowned sparrow	*Aimophila ruficeps*	Rare (resident status unknown)
Say's phoebe	*Sayornis saya*	Common summer resident (breeding)
White-crowned sparrow	*Zonotrichia leucophrys*	Common winter resident
Yellow warbler	*Dendroica petechia*	Uncommon migrant (spring or fall)

NOTE: [1]Distribution determined from surveys conducted for Nowak and Hart 2001; number in parentheses indicates total number of individuals live-trapped and released during both surveys (September and October 2001)

SOURCE: Nowak and Hart 2001

APPENDIX 4

PALEONTOLOGICAL SURVEY OF PROPOSED SITES FOR SEWAGE LINES AND VAULT TOILETS

Paleontological Survey of Proposed Sites for Sewage Lines and Vault Toilets

Bill Parker

January 8, 2003

AGATE MESA **NO IMPACT**

Proposed vault toilet

West of parking area; east of main park road

The site is a low mound of mudstone and claystone covered with a thin veneer of chert cobbles, sparse vegetation, and a deep modern soil profile. The possibility of encountering vertebrate fossils at this site is extremely low; however, wood could be encountered at depth since the log-bearing Sonsela Sandstone is approximately 3–4 meters below the surface of the site. Still, I would not expect any impact of paleontological resources with this project.

JASPER FOREST **NO IMPACT**

Proposed vault toilet

East of parking area

This site is in the same horizon as the Agate Mesa site (about 3–4 meters above the wood-bearing horizon) and is not historically fossiliferous. No fossils were seen on the surface; however, there is still a slight chance of encountering fossil wood at depth. Still, I would not expect any impact of paleontological resources with this project.

PUERCO RUIN **NO IMPACT**

Proposed vault toilet

East of parking area

Geologically this site is situated slightly above the Newspaper Rock Sandstone Bed, which is not known to contain wood or other body fossils. The site has been historically disturbed during the building of the parking area, and there are no potentially fossiliferous outcrops nearby. I do not expect any impact of paleontological resources with this project.

PUERCO SEWAGE LAGOONS **NO IMPACT**

West of main park road, along waterline road

These lagoons are situated in an area that has been historically heavily disturbed. It is also situated in modern floodplain deposits from the Puerco River and is located stratigraphically below the Newspaper Rock Sandstone in a horizon which has yet to turn up fossil remains. I do not expect any impact of paleontological resources with this project.

RAINBOW FOREST SEWERLINE AND LAGOONS **NO IMPACT**
South of Rainbow Forest Concessions Building

Historically, this area has been heavily disturbed. Presently, the project area includes an old road, trash, pieces of broken pipeline, as well as the existing pipe and numerous sewer mains. The line does not encounter any fossiliferous outcrops, being located mainly in the modern floodplain deposits of Jim Camp Wash. Stratigraphically, the project area is 3–5 meters below the log-bearing Rainbow Sandstone, so no intact logs will be found at depth. Some large pieces of wood lie along the line but these are erosional and most have been disturbed by the previous work. These can be moved during the course of the project causing no impact. The lagoons are entrenched in modern sand dunes and floodplain deposits. Overall, I do not expect any impact of paleontological resources with this project.

PDI LIFT STATION **NO IMPACT**
West side of the Painted Desert Inn

The project area is located in an area that does not contain sediments of the Chinle Formation and, therefore, it is improbable that any paleontological resources will be impacted by this project.

PDI-HEADQUARTERS PIPELINE **NO IMPACT**

Between the Painted Desert Inn and Tawa Point, the project area is in more modern deposits above the lava cap of the Bidahochi Formation. As such, there is little chance of encountering fossils in this area. Following the road shoulder from Tawa Point to old Route 66, sediments of the Upper Petrified Forest Member of the Chinle Formation are encountered; however, fossil material is unknown in this horizon. From old Route 66 to the sewage ponds east of the headquarters, the surficial deposits are mainly modern sand dunes. It should also be noted that these areas have been heavily disturbed and contain no fossil wood. It is extremely improbable that any paleontological resources will be impacted during the course of work.

SUMMARY

In conclusion, I do not foresee paleontological resources being impacted during the course of any of these projects. However, unlike archeological resources, which only occur in modern surficial deposits, paleontological resources can be found in any sedimentary bedrock. The Triassic Chinle Formation, which forms the bedrock almost throughout the park, is extremely fossiliferous although fossil occurrences tend to be relegated to specific concentrations in particular horizons. In all of the above cases, the proposed sites occur in horizons that are not historically fossiliferous.

As the nation's principal conservation agency, the Department of the Interior has the responsibility for most of our nationally owned public lands and natural resources. This includes fostering sound use of our land and water resources; protecting our fish, wildlife, and biological diversity; preserving the environmental and cultural values of our national parks and historic places; and providing for the enjoyment of life through outdoor recreation. The department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all our people by encouraging stewardship and citizen participation in their care. The department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. Administration.